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Massachusetts Agricultural

REPOSITORY and JOURNAL.

VOLUME VI.

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Vol. VI.]

JANUARY, 1820.

[No. I.

AN ADDRESS DELIVERED BEFORE THE MASSACHUSETTS
AGRICULTURAL SOCIETY, AT THE BRIGHTON CATTLE
SHOW, OCTOBER 12th, 1819. BY HON. JOSIAH QUINCY.

THE Board of Trustees of the Massachusetts Society for Promoting Agriculture, have requested that I should address you, this day, on topics, connected with the objects of their Institution and with the occasion. In acceding to their appointment, I have yielded to considerations of official duty. For the manner, in which the task shall be executed, I need not apologize to practical and intelligent men, such as I have now the honour to address. They know well how difficult it is to cast over a trite subject the air of novelty, or to make one, that is familiar, interesting. There is also something in the every day labours of agriculture, apparently too rough for a polished discourse, too common for one that is elevated, and too inseparable from soil and its composts to be treated to the general ear, without danger of offence to that fastidiousness of fancy, which is miscalled refinement.

Amid the perils, which thus surround every public speaker upon such topics, where, on the one hand, the rough necessities of the farmer require plainness and particularity; and where, on the other, the over-scrupulousness of the imagination requires that important subjects of agri-

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culture should be generalized, and intimated rather than uttered, I shall deem myself sufficiently fortunate, if it shall be my lot to escape, without failing in fidelity to the interest of the country, and yet without violating the dainty ear of city sensibility.

Our purpose, then, this day is to seek what is true and what is useful in relation to the interests of our agriculture.

In executing this purpose, I shall address myself chiefly to that great body of our countrymen, who are emphatically called—farmers. By which, I mean, the great body of Massachusetts yeomanry ; men, who stand upon the soil and are identified with it ; for there rest their own hopes, and there the hopes of their children. Men, who have, for the most part, great farms, and small pecuniary resources ; men, who are esteemed more for their land, than for their money ; more for their good sense than for their land ; and more for their virtue than for either ; men, who are the chief strength, support, and column of our political society, and who stand to the other orders of the state, in the same relation, which the shaft bears to the pillar ; in respect of whom, all other arts, trades, and professions, are but ornamental work ; the cornice, the frieze, and the Corinthian capital.

I am thus distinct, in declaring my sentiment concerning the importance and value of this class of men, from no purpose of temporary excitement, or of personal conciliation, but because I think it just and their due, and because, being about to hint concerning errors and defects in our agriculture, I am anxious that such a course of remark should not be attributed to any want of honour, or respect, for the farming interest. On the contrary, it is only from a deep sense of the importance of an art, that a strong desire for its improvement can proceed. Whatever tends to stimulate and direct the industry of our farmers ; whatever spreads prosperity over our fields ; whatever carries happiness to the home, and content to the bosoms of our

yeomanry, tends, more than every thing else, to lay the foundations of our republic deep and strong, and to give the assurance of immortality to our liberties.

The errors and deficiencies of our practical agriculture may be referred, in a general survey, with sufficient accuracy to two sources ; the want of scope of view among our farmers, and the want of system in their plans.

Concerning another want, of which farmers are most sensible and most generally complain, the want of cash in their pockets, I shall say nothing, because it is not a want peculiar to the farmer. It is a general want, and belongs to all other classes and professions. Besides, there is no encouragement to speak of this want, because it is one that increases, by its very supply. All of us must have observed that it almost ever happens, with, however, a few splendid exceptions, that the more any man has of this article, the more he always wants.

The errors and deficiencies, to which I shall allude, will not be such as require any extent of capital to rectify. All that will be requisite is a little more of that industry, of which our farmers have already so much ; or that industry a little differently directed. It is not by great and splendid particular improvements, that the interests of agriculture are best subserved, but by a general and gradual amelioration. Most is done for agriculture, when every farmer is excited to small attentions and incidental improvements. Such as proceed, for instance, from the constant application of a few plain and common principles. Such are—that, in farming, nothing should be lost, and nothing should be neglected ; that every thing should be done in its proper time ; every thing put in its proper place ; every thing executed by its proper instrument. These attentions, when viewed in their individual effect, seem small, but they are immense in the aggregate. When they become general, taken in connexion with the dispositions which precede, and the consequences which inevitably

follow such a state of improvement, they include, in fact, every thing.

Scope of view, in a general sense, has relation to the wise adaptation of means to their final ends. When applied to a farmer, it implies the adaptation of all the buildings and parts of a farm to their appropriate purposes, so that whatever is fixed and permanent in its character, may be so arranged as best to facilitate the labour of the farm, and best to subserve the comfort, convenience, and success of the proprietor.

Our ideas, upon this subject, may be best collected from inspection. If our fellow farmers please, we will, therefore, in imagination, adjourn, for a few moments, and take our stand, first, at the door of the farm house. I say "at the door." Far be it from me to enter within it. Far be it from me to criticise the department of the other sex, or to suggest that any thing, peculiarly subject to their management, can be either ameliorated, or amended. Nor is it necessary, for I believe it is a fact almost universally true, that where the good man of the family is extremely precise and regular, and orderly in his arrangements without doors, he never fails to be seconded, and even surpassed, by the order, the regularity, and neatness of the good woman within.

Let us cast our eyes, then, about us, from the door of the farm house. What do we see? Are the fences on the road in good condition? Is the gate whole, and on its hinges? Are the domestic animals excluded from immediate connexion with the dwelling house, or at least from the front yard? Is there a green plot adjoining, well protected from pigs and poultry, so that the excellent housewife may advantageously spread and bleach the linen and yarn of the family? Is the wood pile well located, so as not to interfere with the passenger; or is it located with especial eye to the benefit of the neighbouring surgeon? Is it covered, so that its work may be done in stormy weather? Is the

well convenient; and is it sheltered, so that the females of the family may obtain water without exposure, at all times and at all seasons? Do the subsidiary arrangements indicate such contrivance and management as that nothing useful should be lost, and nothing useless offend? To this end, are there drains, determining what is liquid in filth and offal to the barn yard, or the pens? Are there receptacles for what is solid, so that bones and broken utensils may occasionally be carried away and buried? If all this be done, it is well; and if, in addition to this, a general air of order and care be observable, little more is to be desired. The first proper object of a farmer's attention, his own and his family's comfort and accommodation is attained. Every thing about him indicates that self-respect, which lies at the foundation of good husbandry, as well as of good morals. But if any of us, on our return home, should find our door barricadoed by a mingled mass of chip and dirt; if the pathway to it be an inlaid pavement of bones and broken bottles, the relics of departed earthen ware, or the fragments of abandoned domestic utensils; if the deposit of the sink settle and stagnate under the windows, and it is neither determined to the barn yard, nor has any thing provided to absorb its riches, and to neutralize its effluvia; if the nettle, the thistle, the milkweed, the elder berry, the barberry bush, the Roman wormwood, the burdock, the dock and the devil's apple, contend for mastery along the fences, or flower up in every corner; if the domestic animals have fair play round the mansion; and the poultry are roosting on the window stools, the geese strutting centry at the front door, and the pig playing puppy in the entry; the proprietor of such an abode may call himself a farmer, but practically speaking, he is ignorant of the A B C of his art. For the first letters of a farmer's alphabet are, neatness, comfort, order.

As we proceed to the farm, we will stop one moment at the barn yard. We shall say nothing concerning the

arrangements of the barn. They must include comfort, convenience, protection for his stock, his hay, and his fodder; or they are little or nothing. We go thither for the purpose only of looking at what the learned call the stercorary, but which farmers know by the name of the manure heap. Will our friends from the city pardon us, if we detain them a moment at this point? Here we stop the rather, because here, more than any where else, the farmers of Massachusetts are careless and deficient; because on this, more than on any thing else, depends the wealth of the farmer; and because this is the best criterion of his present, and the surest pledge, of his future, success. What then is its state? How is it located? Sometimes we see the barn yard on the top of a hill, with two, or three fine rocks in the centre; so that whatever is carried or left there, is sure of being chiefly exhaled by the sun, or washed away by the rain. Sometimes it is to be seen in the hollow of some valley, into which all the hills and neighbouring buildings, precipitate their waters. Of consequence all its contents are drowned, or water-soaked, or, what is worse, there having been no care about the bottom of the receptacle, its wealth goes off in the under *strata*, to enrich, possibly, the antipodes. The Chinese, for aught we know, may be the better for it, but it is lost forever to these upper regions.

Now all this is to the last degree wasteful, absurd, and impoverishing. Too much cannot be said to expose the loss and injury, which the farmer thus sustains. Let the farmer want whatever else he pleases. But let no man call himself a farmer, who suffers himself to want a receptacle for his manure, water-tight at the bottom and covered at the top, so that below, nothing shall be lost by drainage, and above, nothing shall be carried away by evaporation. Let every farmer, wanting such protection for his manure, be assured that he loses, by the sun and rain, tenfold as much as will pay all his taxes, state, town, and national,

every year. Let not the size of his manure heap be any objection. If it be great, he looses the more, and can afford the expense the better. If it be small, this is the best way to make it become greater. Besides, what is the expense? What is wanted? An excavation, two or three feet deep, well clayed, paved, and "dishing," as it is called, of an area from six to thirty feet square, according to the quantity of manure; over head a roof made of rough boards and refuse lumber, if he pleases. The object being to shut out the action of the sun and cast off the rain, so that no more should come upon his manure heap than the farmer chooses. This he regulates by spouts at his discretion.

Time will not permit us to stay long upon the farm; we will go out upon it, only for the purpose of making a single observation, and that in relation to the fences.

It is thought to be a great virtue in a farmer to build good fences. And so it is. None can be greater, so far as relates to external fences; those which bound on the road, or a neighbour. They ought to be perfect and sufficient against every intrusion. But when the remark is applied to interior fences, it is often far otherwise. The making and keeping in repair unnecessary fences is one of the greatest drawbacks from the profitable employment of the labour of our farmers. Every year new fencing stuff must be bought, or stone walls must be built and stone walls repaired. Much of that time and capital are expended about these objects, which ought to be employed in collecting manures, in ploughing their land, or in some labour directly conducing to the prosperity of the immediate, or ensuing crop.

The adopting of a single principle, in relation to the management of their farms, would save at once one half of all their interior fences. I allude to the making the distinction between arable and pasture lands permanent, and adopting it as a principle, that no beasts should be permit-

ted to range upon the soil destined to the plough and the scythe.

I know that this proposition will be received by many with surprise, and by some with a sneer. But consider of it farmers. Be assured that the practice of grazing your mowing lands is the falsest of all that bears the name of economy. It is impossible, in a discourse so general as this necessarily is, to give all the grounds of this position. I look at the subject now, only in relation to saving the expense of making fences and repairing them. Let any farmer of middle age take his pencil and calculate what it has cost him, and his ancestors, in the course of his and their lives, to make and maintain rail fences, or stone walls, upon their farms. I am mistaken if one half of the farmers do not find the expense far exceed their present conception, and if the other half do not find, that, at a fair estimate of materials, labour, and interest, the cost of these fences or walls has been more than the whole farm would now sell for under the hammer.

Now more than half of all the stone walls and rail fences in Massachusetts are interior fences, dividing lands belonging to the same proprietor. These interior fences are absolutely useless, except for the purpose of enabling the proprietor to pasture his mowing land. They are worse than useless on exclusively arable land. These walls are in fact harbours for all sort of vermin; for field mice, and woodchucks and skunks and squirrels. Then, on both sides, what a rare assemblage always of elderberries and barberry bushes, and nettles, and all sorts of injurious weeds! Thus not only much land is lost, but worse than lost. There is done a positive injury. Besides, when the plough begins to run, what then? Why, upon many farms, you cannot run a plough forty rods in a straight line, without coming, as farmers say, "plump" upon a stone wall. Then what a "hawing and jeeing!" And the good-natured fellow, at the front yoke, must always take time to

crack his joke, or to have "a cup of comfort," with the good natured fellow at the plough tail. And all this at the direct and positive loss of the owner of the land, or the employer!

But our lands are full of stone, what shall we do with them? Certainly there is no absolute necessity of building them up in the shape of a stone wall. If there be, then thicken, or heighten, your external walls. But this is done already. Well, then, have you never a pondhole to fill up? Is there no useless hollow, into which they may be thrown? If nothing of this kind can be done with them, better pile them up pyramidically, and cover them with grape vines, than go to the expense of building walls, worse than useless.

Let me not be understood to intend, that good farming requires that farmers should level, or remove the walls, or fences, which they, or their ancestors' labour have already provided. The condition of every man's farm is in this respect, a particular fact, by which the calculations of his business should be made, and his conduct, in relation to it, governed. The only object of these remarks is to invite farmers, who are contemplating building new walls, or purchasing new materials for interior fences, to consider, whether their own and oxen's labour may not be better employed; and whether grazing the land, intended to be fenced, be in fact a compensation for the great expenditure, they are about to incur, of the only capital, they have, generally, at their command.

Farmers should never, one moment forget that their and their oxen's labour constitute their capital, and that they should be wasted in no object, which does not add something to the present, or future, years, actual product. It is not too much to say that the capital expended in rail fences and stone walls, which are useless in Massachusetts, would, if it had been applied in collecting manures and in deepening the soil, have added, at this day, a third part to the income of every farmer in the country.

Let every farmer divide his pasture ground as he pleases. Let the fence between his arable and pasture land, be as strong as an external fence. But, if possible, let all his arable ground, though it be a hundred acres, be in one lot. Then his plough runs clear, in a long furrow. His tillage is divided only by the different species of grain and vegetables, he cultivates. There are no fences ; of consequence no inconvenient and worthless headlands ; no apology for thistles and nettles. The scene is beautiful to the eye. The whole has the appearance of a garden ; and begets in the farmer a sort of horticultural neatness.

Before passing to treat, very briefly, the remaining topic of discourse, may I be permitted to say a word on the style of our buildings ? It will be worth the time, if it make only one man, about to build, consider.

The fault is not peculiar to farmers, it is true of men, in almost every rank and condition of life, that, when about to build, they often exceed their means, and almost always, go beyond the real wants of their families, and the actual requisition of their other relations, in life. But let not the sound, practical, good sense of the country be misled, by the false taste and false pride of the city ; where wealth, fermenting by reason of the greatness of its heaps, is ever fuming away in palaces ; the objects of present transitory pride ; and too often, of future, long continued, repentance.

Now, what do we sometimes see, in the country ? Why a thriving farmer, touched with this false taste, will throw up a building thirty, or forty, feet square, two, or two and a half, stories high, four rooms on a floor, with an immeasurable length of out building behind. And what is the consequence of all this greatness ? Why often, for years, the house will not be wholly glazed : or, if glazed, not clapboarded ; or, if clapboarded, not finished ; the destined portico is never put up ; the destined front step is never put down ; and the ragged clapboards, on each side of the front door, there they stand, year in and year out, staring and

gaping at each other, with a look of utter despair of ever being united. And if you go into these mansions, what do you see? Why, you will often find, that while the good man of the house and his consort are snugly provided with warm, well plaistered rooms, the children and all the rest of the family sleep about in unfinished chambers; subject to every sort of exposure; and "the best room," as it is called, in the original plan of the mansion, there it stands, the lumber room of the family, for half a century; the select and eternal abode of crickets and cockroaches; and all sorts of creeping and skipping things; full of old iron and old leather; the stuffing of decayed saddles; the ragged relics of torn bed quilts; and the orts and ends of twenty generations of corn cobs.

When will man learn, that his true dignity, as well as happiness, consists in proportion! In the proportion of means to ends; of purposes to means; of conduct to the condition of life, in which a kind Providence has placed him; and to the relations of things concerning which, it has destined, he should act!

The pride of the farmer should be out, in his fields. In their beauty, in their order, in their product, he should place the gratification of his humble and honourable ambition. The farmer's great want is capital. Never should his dwelling be splendid at the expense of his farm. In this, all that is surplus, in his capital, should concentrate. Whatever is uselessly expended elsewhere, is so much lost to his family and his fortune.

I shall now recur, briefly, to another class of deficiencies, the want of system in the plans of our farmers.

System relates to time, to courses and to modes of husbandry. A full elucidation of each topic would embrace the whole circle of farming dispositions and duties. The time will not permit any thing more than a recurrence to one, or two, leading ideas. Want of system, in agriculture, leads to loss of time and increase of expense. System, has chief reference to succession of crops; to sufficiency of hands;

and to selections of instruments. As to the succession of crops, called rotation, almost the only plan of our farmers is to get their lands, into grass as soon as possible; and then to keep them, in grass, as long as possible. The consequence of this practice, for it deserves not the name of a system, is to lead to the disuse, or rather to the least possible use, of that great source of agricultural riches—the plough. Accordingly, it has almost become a maxim, that the plough is the most expensive of all instruments; and of consequence as much as possible to be avoided. And so it is, and so it must be, as the business of our farms is managed. By keeping lands down to grass, as long as possible, that is as long as the hay product will pay for mowing and making; the consequence is that our lands, when we are obliged reluctantly, to put the plough into them, are bound and matted, and cross-barred, with an impervious, inextricable, infrangible web of root and sod. Hence results a grand process, called “a breaking up,” with four, five, or six head of cattle, as the case may be, with three men, one at the oxhead, a second at the plough-beam, and the third at the plough-handle. Is there any wonder that such a ploughing apparatus is an object of aversion?

It is impossible for any man to witness “a breaking up” of this kind, without being forcibly reminded of the reflection made by a dry Dutch commentator, on that passage in the book of Kings, where it is said, that Elisha was found “ploughing with twelve yoke of oxen.” “Well,” said the commentator, “it is no wonder, that Elisha was glad enough to quit ploughing, for prophesying, if he could not break up with less than twelve yoke of oxen.”

In fact, the plough is the natural instrument of the farmer's prosperity, and the system of every farmer ought to have reference to facilitating and increasing its use. Let a rotation, be adopted, embracing two or three years successive ploughings, for deepening and pulverizing crops, to be succeeded by grain and grass, for two or three years more. The plough, on its return, every five, six, or seven years,

finds, in such case, the land mellow, soft, unimplicated by root, and tender in sod. The consequence is, that "a breaking up" is then done with one yoke of oxen and one man. The expense is comparatively small. There is nothing to deter, and every thing to invite, the farmer to increase the use of that most invaluable of all instruments. It ought to be a principle that our farming should be so systematized that all "breaking up" should be done with one yoke of oxen and one man; who both drives and directs the plough.

Systematic agriculture also requires, sufficiency of hands. Whatever scale of farming any man undertakes to fill, hands enough to do it well are essential. Although this is a plain dictate of common sense, yet the want of being guided by it, in practice, is one great cause of ill success, in our agriculture. Because we hear every day, that "labour runs away with all profits in farming," almost every farmer lays it down as a maxim to do with as little labour as possible. Now this maxim almost always results in practice, in doing with less than he ought. The effect is, almost every where seen in loss of time; loss of season; loss of the employ of working cattle, and loss, or deterioration, of crop. Now, in truth, labour, as such, never yet diminished any man's profit, on the contrary, it is the root and spring of all profit. Labour, unwisely directed and unskilfully managed, is, indeed, a great consumer of the farmer's prosperity. But labour wisely directed and skilfully managed, can, from the nature of things, result in nothing else than profit. What is skilful management and what is wise direction of labour opens a field almost boundless; and not to be attempted on the present occasion. A single remark must suffice. The great secret of European success, in agriculture, is stated to be, "much labour on, comparatively, little land." Now the whole tenor of Massachusetts husbandry, from the first settlement of the country, has been little labour, on much land. Is it wonderful then, that success should be little, or nothing, when conduct is in direct violation of the principle, on which success depends?

With respect to utensils too, system requires that they should be the most perfect of their kind; and always the most perfect in their state.

* Great profits in agriculture can result only from great improvements of the soil. Great improvements of the soil can result only from unremitting industry. The chief study of every farmer *should be what is useful, and what is useless expense, in relation to his art.* The discrimination between these is the master key of the farmer's prosperity. The first should be incurred with a freedom, little short of profusion. The last should be shunned, as the sailor shuns the rocks, where are seen the wreck of the hopes of preceding mariners.

In this art, and almost, in this art alone, "it is the liberal hand, which maketh rich."

Liberality, in providing utensils, is the saving both of time and of labour. The more perfect his instruments, the more profitable are they.

So also is it with his working cattle and his stock. The most perfect in their kinds are ever the most profitable.

Liberality, in good barns and warm shelters, is the source of health, strength and comfort to animals; causes them to thrive on less food and secures from damage all sorts of crops.

Liberality also, in the provision of food for domestic animals is the source of flesh, muscle, and manure.

Liberality to the earth, in seed, culture and compost, is the source of its bounty.

* I am indebted, partly, for the general turn of thought, and for some of the expressions, in a few of the ensuing paragraphs, to a work entitled *Arator*, by John Taylor, Esq. of Caroline county, Virginia;—a work principally destined to ameliorate the agriculture of the State, of which the author is a citizen, but written, so far as it relates to its agricultural tendency, in an admirable spirit, and abounding in reflections at once practical and philosophical.

Thus it is, in agriculture, as in every part of creation, a wise and paternal Providence has inseparably connected our duty and our happiness.

In cultivating the earth, the condition of man's success is, his industry upon it.

In raising domestic animals, the condition of his success is, kindness and benevolence to them.

In making the productiveness of the earth depend upon the diligence and wisdom of the cultivator, the Universal Father has inseparably connected the fertility of his creation with the strongest intellectual inducements, and the highest moral motives.

In putting the brutal world under his dominion, he has placed the happiness of which their nature is susceptible, under the strong guarantee of man's interest.

Instead, therefore, of repining at his lot, let the cultivator of the ground consider his, as among the highest and happiest of all human destinies, since in relation to the earth, he is the instrument of Heaven's bounty ; and in relation to the inferior orders of creation, the almoner of providence.

TRUSTEES' ACCOUNT OF THE CATTLE SHOW, AND EXHIBITION OF MANUFACTURES, ON THE 12TH AND 13TH OF OCTOBER, 1819, AT BRIGHTON.

THE Trustees of the Massachusetts Agricultural Society having assembled at their hall, in Brighton, on Tuesday the 12th of October, conformably to notice, they proceeded to the Meeting-house, accompanied by a great concourse of Members of the Society, and of their fellow citizens, and of distinguished strangers, whom the interesting occasion had collected.

Prayer having been made by the Rev. Mr. Foster, the rules and regulations having been read by the president,

and an address delivered by one of the Trustees, the various Committees proceeded to execute the tasks prescribed to them.

These Committees had been previously selected and arranged, and were constituted in the following manner :

COMMITTEE ON ALL STOCK EXCEPT WORKING OXEN.

Hon. John Lowell, *Chairman*.

Isaac M'Lellan,

Joseph Harrington,

Willard Gay, and

Abijah White, Esqrs.

ON WORKING OXEN.

Hon. John Welles, *Chairman*.

Gen. S. G. Derby, and

Col. Baldwin.

* ON AGRICULTURAL EXPERIMENTS.

Thos. L. Winthrop, *Chairman*.

Gorham Parsons, and

E. H. Derby, Esqrs.

ON INVENTIONS.

Hon. Josiah Quincy, *Chairman*.

T. W. Sumner, Esq. and

Mr. Paul Moody.

ON MANUFACTURES.

Hon. Richard Sullivan, *Chairman*.

Abbott Lawrence, and

John Lemist, Esqrs.

* This Committee at the present time only receive notice for the claim of Premium. The evidences according to the rule prescribed in the list of Premiums, may at any time previous to the first of December, be delivered to either of the above Committee.

ON THE PLOUGHING MATCH.

S. W. Pomeroy, Esq. *Chairman.*

Joseph Curtis, and

Benjamin Goddard, Esqrs.

MARSHALS.

Major Samuel Jaques,

Col. Luther Gay,

Col. D. S. Greenough,

Capt. A. H. Gibbs.

Jonathan Winship, Esq. *Clerk.*

M. D. Worcester, *Assistant Clerk.*

G. G. Channing, Esq. *Auctioneer.*

REPORT OF THE COMMITTEE, ON ALL STOCK, EXCEPT
WORKING OXEN.

THE committee appointed to award premiums upon every species of live stock, beg leave to report, that in the execution of their duties, they have necessarily experienced great embarrassment, resulting not only from the common difficulties which occur in deciding on cases where the shades of difference are scarcely perceptible, but from the unexampled increase of the number of competitors in this part of the exhibition.—These have increased from about thirty-seven to eighty. In many cases there were six or eight competitors for one premium, and as our fellow citizens have learned already, a lesson, well worth all the expense and trouble of these pub-

lic shows, that no animal, who has not some very considerable pretensions, can stand any chance of success, the difficulty has annually increased of selecting those, among many excellent ones, which should be deemed deserving of the premiums of the Society.

It may be useful to remark that the character of the exhibition in this branch of live stock, has every year improved, and the qualities of the animals offered have been regularly more valuable; but to transient observers, this may not seem to have been the case. The trustees have in past years rather discouraged the idea, that their premiums would *hereafter* be awarded to animals of a *monstrous size*—that they should look rather to productive and profitable qualities.

Hence those persons who visited the show with the expectation of seeing something out of nature, (the objects which attract the attention of a multitude, without reflecting that their cost may have been double their ultimate value) may have been disappointed. It is to the *younger* animals chiefly, that the eye of the *judicious* observer would look to ascertain the actual improvement and the solid benefits of this recent exhibition.—We have no hesitation in declaring unanimously, that in, *this* respect, the show of the present year has far exceeded that of any former one, thereby affording most complete proof, that an increased interest and attention had been produced by the exhibition.

If any thing further could be necessary to satisfy the public of this fact, we might add, that the finest specimens of young animals were in almost every case the progeny of those to whom the Society and public suffrage had awarded the premiums on former years.

Thus to instance a few examples—The progeny of the excellent imported bull, Fill Pail, generously given to the Society by the Hon. Mr. Thorndike (though raised in different parts of the country) were in *every* case distinguish-

ed by their resemblance to the sire, and their beautiful proportions, and they afford a reasonable hope (of the soundness of which time only can decide) that they will prove an important accession, and work a rapid improvement in our stock of cattle destined for the dairy.

The same remark may be made with still more force as to the progeny of Mr. Williams's extraordinary imported Teeswater bull.

The descendants of Dr. Foster's prize cow also prove the same proposition.—It may be assumed, in short, from *three years experience*, as an established truth, that the effects which the Trustees hoped to produce by their exhibition, have been realized; which were, *first*, to call the attention of farmers to the difference between good and bad races, and individuals.—*Secondly*, to induce them to bring forward those which excel. *Thirdly*, to enhance their *market value*, thus giving to the raiser, besides his personal gratification in the prize, a substantial reward—and lastly—to preserve from the butcher, the progeny of excellent animals, that the race may be essentially ameliorated.

We say without hesitation, that all these effects were visible in the various classes of milch cows, bulls, bull calves, merino sheep and swine. We wish we were not obliged to add, that we have seen no attempt to improve the breed of our native sheep, but, on the other hand, the specimens exhibited have regularly grown worse.

With these preliminary remarks, which were thought necessary to explain the principles on which the committee proceed, as well as to shew the *real merit* of the exhibition, we proceed to announce the premiums.

For the *best bull raised* in Massachusetts, *above one year old*, to Mr. Jonathan Whitman, 40 dollars.

The second premium, for a bull exceeding one year, to Judge Goodale.

The bull owned by Major John Bigelow, was so excellent, that the committee hesitated whether he was not a fair candidate for the first premium, but the consideration that Mr. Whitman's bull had exhibited proofs of his excellence by the progeny produced, induced them to give the final preference to Mr. Whitman. They gave the second premium of 25 dollars to Judge Goodale's bull, because, in some points, he exhibited qualities which were exceedingly rare, and they thought he might be very useful in improving the race of our cattle in these particular respects.—The universal admiration of him, was also another ground, which induced them to notice him.

There were many very excellent bulls, which their limited authority could not permit them to introduce, such as Moses Kendal's, Eli Stearns' and Benjamin T. Reed's.

For the *Best Bull Calf*, under one year—to Stephen Williams, Esq. of Northborough, 1st premium of 15 dollars. It must be remembered that he was sired by the admirable Teeswater Bull, sent out by Charles Williams, Esq. to his brother, the claimant to whom the premium was awarded.

To Samnel S. Gardner, the 2d premium of 3 dollars; for a beautiful Bull Calf the issue of the Bull Fill Pail, imported by Col. Thorndike. There were some beautiful Bull Calves exhibited by Marquis Converse, Jabez Ellis, Joseph Lovell, Henry Newell, and Gen. S. G. Derby, the two latter by *Fill Pail*.

For the *Best Milch Cow*, not less than three years old—1st premium to Dr. Stearns, of Medford, 40 dollars—2d do. to Luke Fiske of Waltham, 30 dollars—3d do. to Oliver Lock, of Chelmsford, 20 dollars.

There were many other excellent Cows—but the committee on the whole gave the preference to the above.

Mr. Parkman of Brighton had a very fine Cow, respecting which, he produced proof, that she had given 1760 quarts in four months, next preceding the Show.

Major Wheeler's two Cows were very fine—one of them had given 13 quarts at a single milking, and eleven pounds of butter per week.

Mr. Howe's and Mr. Fayerweather's Cows were also very fine—but considering all the circumstances of feed, age, form, duration of giving milk, and adaptation to improve the breed, they decided as above stated.

For the best Heifer from one to three years old—To Gorham Parsons, Esq. 1st premium, 15 dollars—to Dr. Luther Stearns, 2d do. 10 dollars.

The most distinguished after these were Edwin Fiske's and John Fayerweather's.

For the *Best Ox*, fitted for slaughter—to Luke Fiske, 1st premium 50 dollars.

This Ox weighed alive 2798 pounds, being by a few pounds the heaviest Ox ever offered at this exhibition.

To John Fayerweather, 2d do. 40 dollars—to Lewis Lilly, 3d do. 30 dollars.

There were no Merino Wethers offered for premium. This would look as if Merinos were unreasonably getting into disfavour.—We should never forget the success of the Saxons, who have surpassed all Europe in the qualities of their Merino Wool.

The *Native Wethers* offered were below all consideration, and we repeat, that unless the animals offered be of remarkable worth, we give no premiums.

For the *Best Boar*, not exceeding two years old—1st premium to Francis White of Watertown, 10 dollars.

It should be known that this was an imported Boar, and the most perfect animal in his form ever seen in our country. What he will prove on trial, or what effect he may produce in a cross with our native Pigs, is yet to be ascertained.

2d premium to John Prince, Esq. 5 dollars—not imported, but from the imported Bedford breed.

For the *Best Sows*, two in number—to John Prince, Esq. 10 dollars. These also were imported and were admirable specimens.

For the *Best Pigs*, not less than four nor more than eight months old—to Isaac Jefferson, 1st premium 10 dollars—to Edward Jones, 2d do. 5 dollars.

For the *Best Imported Bull*—1st premium to Gorham Parsons, Esq. 100 dollars—2d do. to Cornelius Coolidge, Esq. 75 dollars.

It should be remarked with regard to imported Stock, that the reason we offer a higher sum is, that the first cost and expense of importation very much exceed our premiums—nor will they probably be long continued—the design being to introduce these races which have been so much improved since the emigration of our ancestors.

For the *Best Imported Milch Cow*—to Charles Tracy, Esq. 1st premium, 75 dollars.

To Cornelius Coolidge, Esq. the Trustees voted a special premium (not offered) of 30 dollars, because his Cow was imported at an early age, and not entitled on that account to any premium, but her merit was such, and his exertions so great, that she was deemed a fit subject for notice and reward. She was of the *Holderness breed*, the most distinguished for the dairy.

For the *Best Merino Ram*—1st premium to Nathaniel Ingersoll, Esq. 20 dollars—2d do. Samuel Jaques, Esq. 10 dollars.

For the *Best Merino Ewes*, five in number—1st premium to the said Mr. Jaques, 30 dollars—2nd do. to Nathaniel Ingersoll above named, 15 dollars.

All which is respectfully submitted, with one additional and important remark, tending to shew the perfect impartiality of the Trustees. Four of the committee out of five are not of that body, and are selected from a conviction of their discernment, skill and impartiality, and the only mem-

her on the committee belonging to the board was not a competitor for any prize. It is certain that the decision was as fair as it could possibly be. For errors in judgment the Committee are responsible.

and JOHN LOWELL, Chairman.

REPORT OF THE COMMITTEE ON WORKING OXEN.

THE Committee "On Working Oxen" were gratified to notice the increased competition for the premiums this year. The effect has been to display at this exhibition a fine specimen of well matched and well broken Oxen, of great strength, beauty and docility. These qualities were carefully compared and the usual trial made of their power and faculty of movement, particularly in what is termed "backing" a loaded waggon.

Sixteen yoke were entered for the premium—and after as fair and impartial consideration as the Committee were capable of, they unanimously awarded as follows :

To Spencer Boyden, of Walpole, the first premium	\$30
To William Cobb, of Roxbury, the 2d do.	25
To John Plympton, of Dover, the 3d do.	20
To E. H. Derby, of Salem, the 4th do.	15
To Moses Bailey, of Sterling,	10
To Lewis Lilly, of Oxford,	10

As there was an equality in the opinion of the Committee in the cattle exhibited by the persons last named, they by leave of the Trustees awarded the amount of the fifth premium to each of them.

The Committee would have thought Mr. Parsons entitled to a premium for his cattle (the four that ploughed) had

they have been rightly entered. But they feel it a duty to attend to precision in this respect, lest injury should arise from the precedent.

There were some cattle of great power and value, but not being perfectly trained, particularly in "backing," they were excluded from consideration. Whilst the Committee notice with pleasure the improvement in this useful stock of the country, they hope to induce a little more attention to the defect in training herein mentioned, as it has formed in the minds of the Committee hitherto an essential requisite.

By order of the Committee,

JOHN WELLES, *Chairman.*

REPORT OF THE COMMITTEE ON MANUFACTURES.

THE Committee on Domestic Manufactures adjudge the First Premium for superfine Broadcloths to Messrs Shepard and Jones of Northampton, \$ 30

To Mr. Asa Goodale and Co. of Millbury, the second Premium, 20

For superfine Cassimeres, the first premium to Messrs. Walcott and Groves, of Sturbridge, 15

To the Rock Bottom Company, of Marlboro', the second premium, 10

For superfine Sattinet, first premium to Messrs. Wolcott and Groves, 10

To the Rock Bottom Company, the second premium, 6

For Woolen Cloth of household manufacture—To Mr. Lovett Peters, of Westboro', the first premium, 12

To Payson Williams, Esq. of Fitchburg, the second premium, 8

For Fine Kersey, of household manufacture—To Payson Williams, Esq. the first premium, 12

For Blankets—To Capt. Joseph Lovell, of East Sudbury, the second premium, 4

For Sewing Silk—To Mr. Samuel Childs, of Cambridge, the first premium, 5

For Butter—To Mr. Luke Bemis, of Watertown, the first premium, 10

To Mr. Silas Bemis, of Barre, the second premium, 5

For Cheese—To Mr. John Crehore, of Milton, the first premium, 10

To Mr. Kitridge Hill of New Braintree, the second premium, 5

For Soal Leather—To Capt. Samuel Hobbs, of Weston, the first premium, 10

To Dr. John Bartlett, of Roxbury, the second premium, 5

For Calf Skins—To Mr. Henry H. Hyde, of Framingham, the second premium.—There were four competitors besides. The specimen of one of them, the Committee thought entitled to the *first* premium. But as no name was affixed to the parcel, and no person present to inform the Committee to whom it belonged, the premium could not be awarded.

Premiums were offered for Cotton Cloths, and some kinds of Linen fabrics, but none were exhibited. The Trustees and the public, notwithstanding, have the pleasure of knowing that these branches of manufacture are prosecuted, in this Commonwealth, with a degree of success, which entitle the Manufacturers to an honorary notice from the Society, whenever its countenance is asked.

To do honor to the occasion, and unsolicited by offers of premiums, the benches of the Hall were covered with a great variety of tasteful fancy articles, and beautiful fabrics, which added much to the interest of the Exhibition, and did great honour to the ingenuity, skill and industry, of the persons who presented them.

A large mass of cbrystalized *Alum* was exhibited, from a Factory in Salem—Superb Cut Glass Vases, from the Lechinere Point Factory—A Bonnet which was a good imitation of fine Leghorn Straw, manufactured from a common grass—A variety of fine thread Lace fabrics from the Watertown Factory—Fine Linen Thread, spun by a lady of Worcester—An assortment of elegant Artificial Flowers, the work of Mrs. Elizabeth Willington, of Cambridge.

And among others, a number of articles for which, being of general use, and therefore better entitled to encouragement from the Society, the Committee recommend the following gratuitous premiums:—

To Capt. Joseph Lovell, of East Sudbury, for a Cotton Counterpane, \$4

To Benjamin Wheeler and Co. of Framingham, for Straw Bonnets of a very fine quality, 5

To Mr. Johnson Mason, for do. 4

To Mr. William Wyman, of Boston, for Buckskin Gloves, 5

To Miss Sarah Hearsy, of Dorchester, for a knit Counterpane, 5

To Misses Sarah, Catherine and Hannah Lewis, of Boston, for Tippetts made of Turkey's Down, 6

To Miss Martha Lee, of Beverly, for a knit Cap, 3

To Mrs. Elizabeth Willington, of Cambridge, for Feathers of Turkey's Down, 3

To Mrs. W. Starkwell, of Worthington, for Hearth Rugs, 4

To Mrs. White, of Dedham, for a Counterpane, 4

To Miss Polly Carr of Salisbury, for White Yarn, 3

The Committee think it right to observe, that some of the Cloths of the Rock Bottom Company, of which Mr. Cranston is the agent, and some specimens of other competitors, were highly approved, and that it is very high praise to Messrs. Shepard and Jones, and to Mr. Goodale and

Company, the successful candidates, to say that theirs were better.

It is due especially to the Bellingham Woolen Factory, of which Mr. Amos Hill is the agent, to mention, that the Committee were for some time undecided between the Cloths of this Company and those which obtained the *second* premium.

The double milled Drab Kersey, offered by Mr. Cranstons, agent to the Rock Bottom Company, was thought, by the Committee, the best piece of cloth of the kind they had ever seen of American manufacture, they were of opinion that any so good is very rarely imported from Europe. They regretted that the limits of their authority did not permit them to award a premium for this article.

RICHARD SULLIVAN,
ABBOTT LAWRENCE,
JOHN LEMIST.

Brighton, Oct. 13, 1819.

REPORT OF THE COMMITTEE ON THE PLOUGHING
MATCH.

The Committee on the Ploughing Match, most respectfully report :—

That the ground selected, a green sward, rendered firm from being pastured for several summers past by *fat cattle* that were awaiting the weekly fairs, was surveyed into sections of twenty rods by two, making a quarter of an acre that each team was to plough, five inches in depth. That seven competitors entered the field, and are designated in the order of the lots they drew, as follows, viz. ;—

Lot No. 1. Gorham Parsons, Esq. of Brighton ; team one yoke of oxen, ploughman, Hervey Stone, no driver ; finished in 55 minutes 30 seconds—33 furrows turned.

No. 2. Aaron D. Williams, of Roxbury; team two yoke of oxen, ploughman David Morrison, driver Joseph Howe; finished in 43 minutes 30 seconds—28 furrows.

No. 3. Mr. Asa Wyman, of Roxbury; team two yoke of oxen, ploughman Moses Pond, driver Asa Wyman; finished in 42 minutes—27 furrows.

No. 4. Mr. Isaac Cook, of Brookline; team one yoke of oxen, ploughman Isaac Cook, Jr. (a lad,) driver Daniel Phillips, (a lad;) finished in 55 minutes—34 furrows.

No. 5. Hon. Josiah Quincy; team one yoke of oxen, ploughman Joseph Goodspeed, no driver; finished in one hour 49 minutes—39 furrows.

No. 6. Mr. Stedman Williams, of Roxbury; team two yoke of oxen, ploughman S. Williams, driver David Howe; finished in 38 minutes—25 furrows.

No. 7. E. Hersey Derby, Esq. of Salem; team a pair of low priced horses, ploughman Henry Burreck, no driver; finished in 65 minutes—39 furrows.

Your Committee award as follows, viz. :—

First premium to Mr. Isaac Cook,—plough \$20; ploughman, Isaac Cook, Jr. 15 years of age, \$10; driver, Daniel Phillips, 16 years of age, \$5; total \$35.

Second premium to Gorham Parsons, Esq.—plough \$12; ploughman, Hervey Stone, \$6; do. do. (no driver) \$3; total \$21.

Third premium to Hon. Josiah Quincy—plough \$8; ploughman Josiah Goodspeed, \$4; do. do. (no driver) \$2; total \$14.

Your Committee observed, that the several teams on the field were in fine order, under good command, and the ploughs of substantial and approved constructions.

They beg leave to remark, that the teams owned by Messrs. Williams and Wyman appeared to combine strength with great activity, and to have been used to constant service and good keeping—*pre-requisites* to successful farming

—and had the ploughman taken more time in the execution of their work a different result might have been expected.

Mr. Derby's plough exhibited very regular handsome work, and in reasonable time; but when your Committee took into consideration the expense of a *horse* team for *farm work*, compared with oxen, keeping in view the continual deterioration of *capital* vested in *horses*, they were impelled to a decision different from what the same performance under other circumstances, would have been entitled to. They, however, recommend a gratuity of six dollars to the ploughman, as a reward for the skill displayed by him.

In considering the performance of Mr. Quincy's plough, your Committee were constrained in some measure, by their construction of the terms on which the premiums were offered, viz. "the best work with the least expense of labour," to place *time* against *good work*, as it was unquestionably the best in the field, and the team under exemplary discipline.

They would further remark, that the several lots were nearly equal, except the one drawn by Mr. Parsons, which was encumbered with a number of fixed stones, and being part of a headland, by far the hardest ground; though your Committee had no criterion for ascertaining the difference, they acknowledge it did not afford a fair specimen of the goodness of his plough, but strong evidence was furnished of the skill of the ploughman, and the vigour and discipline of his team.

On the performance of Mr. Cook's plough, conducted by boys, your Committee offer no comment. They trust that the Members of this Society, and the Farmers in general throughout the Commonwealth, are alive to the importance of accustoming their sons, at an early age, to the use of an implement so essential to the existence of all arts; and

were this more practised, they venture to predict, there would be less complaint of hard times.

SAMUEL WYLLYS POMEROY, *Chairman.*

Brighton, October 13, 1819.

REPORT OF THE COMMITTEE ON AGRICULTURAL
EXPERIMENTS.

The Committee to consider the claims for premiums on Agricultural Experiments, report :—

That Payson Williams, Esq., of Fitchburg, in the County of Worcester, is entitled to the Society's premium of forty dollars, for a crop of Spring Wheat, being twenty-eight bushels and thirty quarts, raised on one acre and one eighth part of an acre of land.

That Dennis Stebbins, Esq. of Deerfield, in the County of Franklin, is entitled to the Society's premium of thirty dollars, for the best crop of Potatoes, being six hundred and twelve bushels raised on one acre of land.

That Doctor James Thacher of Plymouth, in the County of Plymouth, is entitled to the Society's premium of thirty dollars, for a crop of Ruta Baga, or Swedish Turnips, being four hundred and twenty eight bushels, raised on one acre of land.

And that Mr. Eben Thrasher of Salem, in the County of Essex, is entitled to the Society's premium of thirty dollars, for a crop of Beets, being six hundred and thirty-five bushels, raised on one acre of land.

Mr. Payson Williams of Fitchburg, exhibited proof of his having raised on one acre, and one tenth part of an acre, five hundred and thirty-five bushels of Potatoes, produced partly from the round white sort, of which he planted the

seed ends only on one half of the land ; on the remainder he used the long red, or South American Potatoe.

Stephen Williams, Esq. of Northborough, in the County of Worcester ; Mr. Nathaniel Bond of Watertown, in the County of Middlesex ; and Thomas Shepherd, Esq. of Northampton, in the County of Hampshire ; as competitors for the premium offered for the best crop of Ruta Baga. David Little, Esq., of Newbury, in the County of Essex ; and Mr. William Hutchins of Roxbury, in the County of Norfolk ; for the premium for the best crop of Carrots. Lewis Bigelow, Esq., of Petersham, in the County of Worcester, for the premium for the best crop of Potatoes. And David Little, Esq., for the premium for the best crop of Beets, caused their names to be duly entered, but did not furnish the Committee with the evidence prescribed by the Rules of the Society.

No claims for premiums were exhibited to the Committee, for introducing a Grass, superior to any now cultivated—for soiling of Cattle—for turning in green crops as a manure, and proving its utility and cheapness over any other manure, nor for proving by actual experiment, the best season and mode for laying down lands to grass, whether spring summer or fall, seeding be preferable, and with or without grain, on different soils. The enlightened farmers of Massachusetts have without doubt attended to these objects ; and the Committee would have been much gratified had they been enabled to communicate the result. Our genial summers having revisited us, it will perhaps be advisable to give some attention to Agricultural experiments, that we may be better prepared for any unpropitious change of seasons. The Committee are unwilling to close their report without noticing some experiments, made by several members of the Board of Trustees, to raise in this climate the Sweet Potatoe ; but more particularly those by the President and the Corresponding Secretary, the latter has

succeeded the two past seasons much beyond his expectations, in raising this potatoe on his grounds in Roxbury. The President caused to be exhibited at the Show in Brighton, some very fine potatoes produced on his farm in Chelsea, from cuttings of the vine brought in May last from Charleston; one of the potatoes exhibited, weighed seven pounds, and in all respects, excepting the absence, in some small degree, of the saccharine quality, they resembled the potatoe of the Carolinas.

By order of the Committee.

THOMAS L. WINTHROP, *Chairman.*

Boston, December 1, 1819.

Fitchburg, November 12, 1819.

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN,

IN becoming a candidate for your premium on Wheat the present season, I feel a diffidence; as to me it appears almost certain, I shall (in *quantity* at least) fall far behind my more successful competitors. This consideration, however, shall not deter me from what I deem my duty.

The land on which the wheat was sown, was in 1818 planted with Potatoes (for one acre of which I obtained your premium) which after harvesting was ploughed a short time before the setting in of winter. In the spring of 1819 as soon as practicable, (after spreading on six loads of fermented manure it was again cross ploughed—26th April sowed on the furrows two bushels of what is known by the name of the *Gilman* Wheat, (which I procured of the Hon. P. C. Brooks, of Boston,) on one acre and twenty square rods, and cross-harrowed the same, following the harrow at the same time with the clover seed, which in turn was cross-harrowed in. The wheat before sowing was washed in

water until perfectly clean, then immersed in a liquor, or lye, made in the proportion of four pints of water to every pound of wood ashes, then add one pound of unslacked lime to every bushel of seed ; as recommended by M. Du Hamel, (see Massachusetts Agricultural Repository and Journal, No. 2. of Vol. 5. for 1818.) When the wheat plant was out of ground two inches, I sowed on a part of the field, Plaster of Paris, at the rate of ten bushels to the acre, which I never have been able to discover has had the least effect, (I had the like ill success in the use of a ton, on various parts of the farm.) The amount of wheat by actual measure, was twenty-eight bushels and thirty quarts. It may here not be improper to state, that on the most close examination, I could not discover one kernel of smutty grain in the whole crop, and had it not been for the ravages of the grasshopper in this field (in many parts of which they cut off one fourth part of the heads, which of course were lost,) there would probably have been thirty-four bushels. I esteem this kind of *wheat*, a valuable acquisition to this part of the country. The grain weighing sixty-two pounds to the bushel, and yielding at the mills in this quarter, forty-five pounds of flour, in quality equal, I think, to the best Baltimore.

PAYSON WILLIAMS, *Owner.*

AARON BIXBY, *Assistant.*

WORCESTER ss.

November 16, 1819.

Personally appeared, Payson Williams, and Aaron Bixby, and made oath that the above statement by them subscribed, contains the truth and nothing but the truth,

Before me,

CALVIN WILLARD, *Justice Peace.*

Fitchburg, September 11, 1819.

This is to certify, that I Philip F. Cowdin, sworn surveyor of the town of Fitchburg, have this day measured a certain plot of land, which was sown with wheat, and owned by Payson Williams, of said Fitchburg, in the County of Worcester, and find it to contain one acre and twenty rods, and no more.

PHILIP F. COWDIN.

Deerfield, October 4, 1819.

I, John C. Hoyt, surveyor, have measured a tract of land in Deerfield, belonging to Maj. Dennis Stebbins, bounded West on the meadow road, and North East and South on land of said Stebbins, and hereby certify the same contains one acre and no more.

JOHN C. HOYT.

Franklin, ss. October 7, 1819. Then John C. Hoyt, made oath to the truth of the above certificate, before me,
PLINY ARMS, *Justice Peace.*

Deerfield, October 13, 1819.

The above tract of land lies in the North Meadow in Deerfield, and is of a heavy rich loam. In the summer of 1818, there was raised upon it broom-corn, and no manure applied, and it has been appropriated for the last eight or ten years alternately, to the raising of corn and potatoes, except one year a crop of hemp. The years, in which corn was raised, there was applied about five loads of manure. May 15, 1819, the above land was planted in drills

or rows, the rows three feet apart, and the seed dropped in, about one foot asunder—there was applied twenty loads of manure, a small shovel full under each potatoe, which were cut into three pieces. The land was first ploughed and then drilled or furrowed out for the reception of the seed, with a small plough and one horse, the seed was then covered with a hoe—thirty-three bushels was the quantity of seed used, and they were a long red kind, known here by the name of *merino*. June 11th, just as the tops began to make their appearance, with a single horse there was turned two furrows on to each row, which nearly covered all the tops, and by the application of a hoe, they were completely covered. June 23d, there was turned two light furrows upon each row, for the purpose of destroying the weeds, not intending to increase the hills or ridges, and the few weeds that remained were subdued by hoeing. July 6th, the few scattering weeds that appeared were pulled up by hand. They were dug with the hoe, and finished October 13th, and the produce was six hundred and twelve bushels.

DENNIS STEBBINS.

JOHN STEWARD.

Deerfield, October 13, 1819.

We, John Steward and George Washburn, do certify that we assisted in digging all the potatoes on the above land, and by careful and actual admeasurement, there was six hundred and twelve bushels.

JOHN STEWARD.

GEORGE WASHBURN.

Franklin ss. October 13, 1819. Then Dennis Stebbins, John Steward and George Washburn, made oath

to the truth of the facts contained in the certificates by them respectively signed, before me,

PLINY ARMS, *Justice Peace.*

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN,

THE following are the circumstances relative to the acre of land cultivated with Ruta Baga, or Swedish Turnips, for which I put in my claim for a premium.

The situation of the land is such as to form a gentle declivity from the north, giving it a southern exposure. The soil is a light loam, in some parts sandy, and much disposed to suffer by drought. It is occupied by forty-nine apple trees, the most of which are of thirteen years growth. It had for several years been in grass, yielding about one ton and a half of hay annually. In 1818 it received about twenty tons of manure, and produced an ordinary crop of corn and potatoes. In April 1819, it was ploughed, and in May and June, it was twice ploughed and harrowed by a single horse, and thoroughly pulverized preparatory to seeding. From the 22d, to the 28th of June, the ruta бага seed was planted in the following manner. Deep furrows were made about four feet asunder, in which was laid a quantity of manure, two furrows were ploughed on each side which covered the manure, and the whole formed a ridge of four furrows; upon this ridge directly over the manure, the seed was immediately planted, and the earth smoothed and pressed down with a hoe. Soon after the seedlings appeared, they were thinned out to ten or twelve inches apart, and the weeds were destroyed. In July, and in August, we ploughed twice between

the rows, carrying the plough within four inches of the plants and throwing the earth into a ridge, in the intervals, after which it was ploughed back against the plants and the ridges were hand-hoed. July 27th to 29th, we transplanted about fifteen hundred plants on a part of the acre reserved for that purpose in rows without ridges, two and a half feet apart, and one foot distance in the rows, and transplanted to fill vacant places on the ridges, leaving each plant ten or twelve inches asunder throughout the whole. In the first week in September, the earth was loosened round the roots with a narrow hoe. The quantity of manure on the acre was ninety horse loads, or about thirty tons, it consisted of stable manure with sea weed, street dirt and various vegetable substances. The quantity of seed was one pound, but half a pound would have been amply sufficient. I planted some seed on the 16th July and transplanted to fill some vacant places as late as the 20th August, and these attained a tolerable size, but all that were transplanted, proved greatly inferior to those which remained on the seeded ground. The crop was harvested from the 4th to the 10th of November and being accurately measured, the amount was four hundred and twenty-eight bushels.

EXPENCES.

Thirty tons manure,	\$45 00
Three ploughings, and harrowing	8 00
Ploughing twice between the rows	8 00
The whole of the labour, planting, hoeing, and trans- planting 26 days, for one man at 75 cents	19 50
One pound of seed,	1 50
Harvesting the crop, eleven days	8 25
	<hr/>
	90 25
	<hr/>

By 428 bushels ruta бага at 40 cents	. . .	\$171 20
Ruta бага tops equal to one ton English hay	. . .	15 00
		<hr/>
		186 20

We the subscribers certify that the foregoing is a true statement, according to the best of our knowledge, except that Henry J. Douglass does not vouch for the harvesting and measuring the crop.

JAMES THACHER.

HENRY JAMES DOUGLASS, *Laborer.*

PLYMOUTH, ss.

November 25, 1819.

Then personally appeared, James Thacher, and Henry James Douglass, and made oath to the truth of the foregoing statement by them subscribed, before me,

BEZA HAYWARD, *Justice Peace.*

These certify, that I have measured a piece of land containing one acre on which Dr. James Thacher obtained the above mentioned crop of ruta бага.

ROSSETER COTTON, *Surveyor.*

PLYMOUTH, ss.

December 1, 1819.

Then personally appeared, Rosseter Cotton, Esq., and made oath that on measuring the acre mentioned in the foregoing certificate by him subscribed—he discharged his duty as surveyor faithfully and impartially, before me,

BEZA HAYWARD, *Justice Peace.*

We the subscribers certify that we harvested and measured the crop of ruta бага, produced on the acre measur-

ed by Rosseter Cotton, Esq. as above, and that the whole number of bushels was four hundred and twenty-eight.

THOMAS NELSON.

JAMES COLLINGS.

PLYMOUTH, ss.

November 30, 1819.

Then personally appeared, the above named Thomas Nelson, and James Collings, and made oath that in measuring the crop of ruta бага mentioned in the foregoing certificate, by them subscribed, they performed the same, faithfully and impartially, before me,

BEZA HAYWARD, *Justice Peace.*

The ruta бага may be considered as an important acquisition to our agricultural productions, affording an excellent fresh forage for horses, cattle, sheep and swine throughout the year. Having devoted much attention to the culture, the past season, I take the liberty to recommend to the attention of farmers, who may be unacquainted with this valuable article the following particulars. 1st. Deep ploughing and plentiful manuring. 2d. Pulverizing the earth in the most effectual manner. 3d. Planting the seed and transplanting the plants as speedily as possible, after manuring and ploughing that the germs and roots may receive all the advantage of a fresh fermentation, which is a point I believe, not sufficiently appreciated by agriculturalists; another point of importance, is to roll or press down the earth after sowing, else in a dry soil the small seeds not coming in immediate contact with the earth, cannot vegetate. 4th. Deep ploughing between the rows by which the mould is exposed to the influence of the air, and those chemical changes facilitated, on which the growth of vegetables essentially depend. The result of my experiment shews decidedly, that ridging on land naturally light and dry, is inju-

rious to the crop, and that had the intervals between the rows been two and a half or three feet, instead of four feet wide, the product would have been considerably more abundant. Mr. Cobbett asserts, that the amount of the crop is always greatest when transplanted, but his position is not confirmed by my experiment. I should prefer re-seeding in vacant places, at several different periods, and the superabundant plants will be in readiness for transplanting if required. It is, nevertheless, an important consideration, that a crop of ruta бага by means of transplanting, may be obtained after taking off a crop of early potatoes, pease, oats, or any other grain harvested by the first, or even the tenth of August. It should be observed that the young plants while in the nursery should not be crowded nor shaded, and for transplanting should be large, the bulbs about the size of a man's finger. I am of opinion that ruta бага affords a more profitable crop than any other vegetable, unless carrots be an exception. Judging from the produce of the same acre the last year, and also from the contiguous land the present season, I conclude that it would not have yielded more than one hundred and fifty bushels of potatoes, and I think it may be affirmed, that land which yields forty bushels of Indian corn, will produce seven or eight hundred or more, bushels of ruta бага. When these turnips are intended for the table, those should be selected which were planted the latest and are of quicker growth. Swine may be brought to eat them in a raw state, but it is more economical to boil or steam them. It is among the peculiar excellences of ruta-baga, that if preserved from frost, the roots will retain their soundness and good qualities through the year and probably much longer. Cobbett observes that they are not fully ripe, and fit for use, until February. The leaves of ruta бага are eaten voraciously by cows, but they cannot be preserved long without spoiling, and they impart somewhat of an unpleasant flavour to

the milk. My store pigs are kept in a thriving condition on the leaves without any other food.

JAMES THACHER.

I James Snow of Salem, in the County of Essex, on solemn oath declare, that I saw Ebenezer Thrasher, take off of one acre of land in Southfields, in said Salem, two hundred barrels of beets, and to the best of my knowledge and belief, fifty four barrels more, all which beets grew on the said acre of land the season past.

JAMES SNOW.

I Jeremiah Bean of Salem, in the County of Essex, on solemn oath declare, that I have worked for Ebenezer Thrasher, for six months last past; that to my knowledge, the said Ebenezer Thrasher, raised on one acre of land, situate in Southfields in said Salem, two hundred and fifty-four barrels of beets, the season last past—that I assisted the said Thrasher, in cultivating said land, and saw the beets packed in barrels, and counted the said barrels myself.

JEREMIAH BEAN.

Essex, ss.

October 25, 1819.

Then James Snow, and Jeremiah Bean, severally made solemn oath that the within affidavits by them severally subscribed, are true in every particular, before me,

JOHN PUNCHARD, *Justice Peace.*

I Ebenezer Thrasher of Salem, in the County of Essex, on solemn oath declare, that in the summer of 1819, I raised on one acre of land by exact measurment, two hundred and fifty-four barrels of beets—that I assisted in packing

said beets in barrels, and counted the barrels when filled. The said land is situate in Southfields, so called, in said Salem.

EBENEZER THRASHER.

ESSEX, ss.

October 25, 1819.

Then Ebenezer Thrasher, subscribed, and made solemn oath to the truth of the above affidavit, before me,

JOHN PUNCHARD, *Justice Peace.*

This is to certify, that the land on which I raised two hundred and fifty-four barrels of beets, in 1819, was cultivated as follows, viz. : I ploughed the land April 16th, and then spread on, seven cords of manure of different kinds, then harrowed the land over three times, April 24th.— Ploughed the land over again, and likewise harrowed it over twice, April 26th. Ploughed it over again and added four cords manure, then harrowed three times, then raked it over, then sowed five pounds of seed, the distance between the rows being two feet, and hoed through in the course of the season three times, and wed twice, and on the 19th October, begun to dig the above named, and ended on the 23d October. They were cultivated as above named, to the best of my knowledge.

EBENEZER THRASHER.

Salem, October 25, 1819.

I hereby certify, that the land set off by me, for Mr. Ebenezer Thrasher, on which beets were growing at the time, (October 18, 1819,) contained one acre accurate measurement.

JAMES GALE, *Surveyor.*

Fitchburg, November 12, 1819.

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN,

PURSUANT to the object, for which one acre and fifteen square rods, as measured by P. F. Cowdin, and entered on your books for a premium, I take the liberty to state, that in 1818, said land was made use of as part of a sheep pasture. The nature of the soil is what is generally termed by farmers, warm chestnut land; excellent for grain. After blowing, digging and getting off a part of the rocks into a double wall, (which enclosed the field from the original pasture) it was ploughed early in the autumn of 1818, for the first time (probably) since its creation. Early in the spring following, it was harrowed, cross-ploughed and again harrowed, and after furrowing four feet apart one way, had the manure (unfermented and made from neat cattle and sheep) placed as near as could be judged, two feet distant. The potatoes planted, 20th and 21st May. Took of seed twenty-five bushels; one half the field planted with the seed-ends of the round whites (I am unable to call them by any other name, as the seed was brought to this place twenty years ago, from Andover, Mass.) the other part with the Rio de la Plata, or long reds, cut in the usual manner. Were hoed for the first time 14th June; second and last time 25th same month. Were harvested the last part of October, and by actual measure were, five hundred and eighty bushels on one acre of the above, and fifteen bushels on the fifteen square rods, making in all five hundred and ninety-five bushels from the field. To account for the very great inequality in the relative number of *bushels* and *rods*, of the acre and the fifteen square rods over, it will be necessary to state, that from fifteen to thirty rods of the

north part of the piece, the crop was comparatively light with the other part of the field, which was attributed by those knowing to the fact, to its being bounded on that side, by a large and thrifty growth of chestnut and other timber, whose roots, beyond a doubt, come in for a share of the earths vegetative properties. As to the odds in bushels between the red and white the former yielded ten bushels more than the latter. I, however, consider my crop of whites the most valuable.

PAYSON WILLIAMS, *Owner.*

AARON BIXBY, *Assistant.*

WORCETER, ss.

November 16, 1819.

Personally appeared Payson Williams, and Aaron Bixby, and made oath, that the above statement, by them respectively subscribed, contains the truth, and nothing but the truth, before me,

CALVIN WILLARD, *Justice Peace.*

Fitchburg, November 16, 1819.

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN,

I DEEM it not improper, in becoming a competitor for the premium on potatoes, to send you minutes of the expences attending the raising one acre and fifteen rods of that vegetable. It will be seen that in the relative expense and profit, in comparison with the carrot and many other roots, it would leave a considerable amount of *profit* in favour of the tap rooted vegetable; yet we should at the same time consider, that where the potatoe is generally cultivated, it would be utterly impracticable to cultivate the other

roots.* This is case of the above mentioned plat ; it being literally a bed of rocks, which after blowing and getting off the principal part into a wall and planting a crop of potatoes, the land is in an excellent state for a crop of wheat, followed by a crop of clover. The inducements for attempting to bring too such a piece of hard land (where it is so cheap as twenty dollars the acre) were, its having annually a very heavy crop of *thistles* (a sure indication of its rich and excellent qualities, for the growth of other and more valuable vegetation) together with its being but thirty rods from the house and barn. It will likewise be remembered that the enormous expense in subdning the above-mentioned land is in a great measure attributable to its being very rocky, which had an influence in retarding the work in every stage, even to the taking out the potatoes in the fall.

EXPENSE.

Breaking up the ground, four yoke of oxen and three	
men one day	\$ 7 00
Half day harrowing, oxen and man	1 00

* It will likewise be recollected that the culture of the potatoe (notwithstanding what Mr. Cobbett says to the contrary,) is a grand promoter of the success of the crop which is immediately to follow, particularly wheat. It will also be admitted, that this root is invariably made subservient in reclaiming rough lands. But setting aside its peculiar advantages above stated, it will be seen after giving every degree of latitude to the expense, that it is, independently, a profitable crop. The expense we here find to be seventy-five dollars sixty cents, the product five hundred and ninety-five bushels, at twenty-five cents per bushel from the field in this part of the country, will be	
- - - - -	\$ 148 75
Deduct for expense - - - - -	75 60

Gain from one acre and fifteen rods - - -	\$ 73 15
And left the land in a complete state for the ensuing year.	W.

Amount brought forward	\$ 8 00
One day cross ploughing, 2 yoke oxen, 2 men	4 00
Furrowing half day, 2 men and 1 yoke oxen	1 50
Seeded with 25 bushels potatoes at 3s. (seed ends)	12 50
Twenty buck loads unfermented manure (30 bush- els to the load)	20 00
Three men and 1 yoke oxen, 2 days planting	8 00
First hoeing four days man, and half day horse ploughing	4 50
Second hoeing the same	4 50
Fifteen days in harvesting the crop (595) at 84 cts.	12 60
	<hr/>
	\$ 75 60

Fitchburg, September 17, 1819.

This is to certify that I, Philip F. Cowdin, sworn surveyor of the town of Fitchburg, have this day measured a certain plot of land, planted with potatoes and owned by Payson Williams of said Fitchburg, in the County of Worcester, and find the same to contain one acre and fifteen rods, and no more.

PHILIP F. COWDIN.

[There being no competitors for premiums for inventions, under circumstances, which authorized the Committee on that subject to award any, none were adjudged.]

ON THE BAD MANAGEMENT OF ORCHARDS.

[Communicated for the Massachusetts Agricultural Repository.]

WHY are farmers so neglectful of their orchards? Our farms are portioned out into orchard, mowing, tillage and pasture. This is so common a division, that a plantation of

fruit trees must have been considered a useful occupation of the soil. But in what a state are the trees in most parts of the country ! Good orchards are, however, sufficiently numerous to shew that good management in this branch of husbandry is as profitable as in any other.

If some districts are well stocked with trees, others exhibit only a few, scattered along on the road side, old and in a decrepid state, the remnants of fine orchards of better days.

But, in respectable farming towns, in all parts of the Commonwealth, one may see, in the fields, apple and other fruit trees, bristled all over, from root to top, with branches like whip sticks ; hide bound, cankered and covered with moss. All the sap which, in this state of the trees, the roots can supply, is little, if any, more than enough to feed the years growth of wood. At best, the produce is but a small quantity of half grown degenerate fruit.

Many farmers think no attention necessary to young trees after planting, unless it be to keep the ground open round the roots for a year or two. The stocks are then left entirely to their own instinct of self preservation and natural tendency to grow and fructify. The innate vigor of the plant is all its dependence. Its self renovating power, its only means of recovery from injuries inflicted by insects. If a tree survives early neglect, the untamed luxuriance of its top, seems to reproach the farmer for his want of care, as its redundancy of wood, is incompatible with the production of fruit.

Bad cyder is as common as poor orchards. Whether the great consumption of ardent spirits is the cause, or the effect, of the indifferent quality of the cyder made in this State, the use of them is at least countenanced by it. Not a tavern keeper, or inn holder, thinks that the credit of his house is in any degree affected by the quality of the cyder he may offer to his guests, however poor it may be.

It is apology enough, that any better than his is rarely found in private houses. There are but two states in which this liquor is commonly seen. It is either syrup, or verjuice. A farmer's family will gorge themselves with the first for about six weeks after the cyder comes from the press, and then drink the latter all the rest of the year, unless indeed, its corrosive asperity should render a recourse to rum or brandy necessary.

Perhaps not many of the tables of our farmers, mechanics, and laborers, are regularly supplied at meals with ardent spirits, as a family beverage. But the heads of families and hired men drink but sparingly of sour cyder, knowing that such an indulgence as would satisfy their craving for liquid, would be attended with severe colic and other unpleasant effects. The complement of drink for workmen is commonly, therefore, made up with ardent spirits, taken at other times during the day. It would be going too far, to assert, that the farmers, as a class, are intemperate in the use of ardent spirits. It is, however, a subject of regret, that the practice is not more disreputable, and that young men in their full health and vigor, should so often require of their employers, an allowance of *a half a pint of spirit per day*, as a *necessary* of life. *Sour* cyder would invigorate more without impairing the tone of the stomach. But how few farmers have it in their power to offer the alternative. A good method of making, in the first place, and then of preserving, cyder, is so rarely practised, that farmers are themselves to blame that they are at so much expense for rum, when there can be little doubt, that their hired men and they themselves would give a preference to cyder, not sour. They have but to cherish their orchards, and to pursue *well known* methods in manufacturing and curing the liquor, to be relieved from a vexatious expense, and the still more vexatious evils of occasional, or habitual, intemperance.

Fruit is not a staff of life, but it is an innocent and refreshing luxury. Its medicinal uses give it also, no inconsiderable value. Taken in all the variety which our climate admits of, it may be made to contribute largely to health, comfort and enjoyment. As it is not a principal article for the sustenance of life, neither is it one which requires any great or constant labor to secure. Compared with bread stuffs and culinary vegetables, and considering the labor bestowed on these, it is almost a free gift of Providence. Fruit trees may be grown in fields in which grain and vegetable crops are cultivated, not only without interfering, while young, with the processes which these latter require, but so as to derive benefit from them without diminishing the ground crops. And when the trees have attained to their full size, the soil occupied by their roots, and the space shaded by their tops, if lost for tillage, will pay a greater profit from the trees, if well pruned and kept clean, than it would, employed in any other culture. The labor in keeping the trees in order, is very trifling, if bestowed seasonably. Most of what is required, should be done in the spring, before the frost leaves the ground, and other business is pressing.

It is well known that fruit trees may be cultivated with advantage in ground too rocky for tillage, without losing the use of it as pasture, provided stakes are set to keep off the cattle. The soil must, however, be kept open about the young trees, to obtain a free growth. It is, unnecessary to say that manure may be applied with advantage, and that the value of it will not be lost when so applied. The declivities on the south sides of hills, which are too steep, or too rough, for the plough, afford fine situations for fruit trees. So that on many farms, extensive orchards of various kinds of fruit may be had, without interfering with, or diminishing the amount of other crops.

The apple, pear and cherry, are certain enough as bearers to justify a reliance upon them for profit. The peach and plum are delicious fruits, and this character would seem to entitle them to a trial on every farm. They should be planted near to the buildings—the former on the south side for greater warmth, the latter on the north side for the advantage of the shade, which the plum requires.

The varieties of the several species of fruit which may be brought to perfection in this Commonwealth, are numerous, and are cultivated with success near the coast, but are little known in the interior. They are, however, common enough to furnish scions for every county, in the state. Our farmers have only to decide, that they will turn their attention to the raising of fruit, and they will have no difficulty and little or no expense in obtaining scions of the best. But it ought, at the same time, to be recollected, that as the improved and most delicious fruits have come of careful cultivation, and are derived from originals of very ordinary character, so if the trees are treated with neglect, these fruits will degenerate and in a short time be no longer cognizable as the same.

It may not be *universally* known, that by taking off a portion of the fruit from a healthy tree, at an early stage, what remains will become larger and be finer than if the whole were suffered to remain—because more sap is at liberty to be expended upon them. Keep the earth loose about the roots, and manuring produces the same effect—enlivening the roots and encouraging them to put forth more fibres, and in consequence, a greater quantity of nutrition is absorbed, of which the fruit will get its proportion.

Whatever promotes a free circulation of the sap, as cleansing the bark from scales and scraping it to make it tender and yielding, and whatever helps to perfect the maturation of the sap in the leaves of the tree, by giving them a full exposure to the sun and air, as by cutting out the

central branches when the head is too bushy, and giving it an expanded form, promotes the growth, general health, and productiveness of the tree.

It would require little time to satisfy any rational mind, that the caterpillar, the canker worm and the slug, by devouring the leaves, destroy a part of the machinery necessary to the work of vegetation and fructification. The tree must therefore decline if they are permitted to invade it, and to keep possession year after year.

A large stock of fruit trees may be raised with very little trouble by fencing in a few rods of good ground as a nursery, and sowing pomace on part, and reserving part for the seeds or stones of other fruit. There should be space enough within the enclosure to admit of transplanting the shoots the second year. The following year they will be in a state for budding or for grafting. In the mean time, the farmer may learn by a little inquiry where the buds and scions may be obtained when wanted.

This nursery will not only supply his new plantations, but afford fine thrifty trees, to take the places of such as decay in the orchard. He will thus avoid the effects of the ignorance, or deceit, of nursery men, whose trees not seldom prove not to be of the kinds, for which they are sold. This is true in many instances of trees which have been ordered from New York.

We have before adverted to the number of fruit trees which may be seen scattered over the face of the country in the more populous districts. But from the languishing state in which they are, they seem to have been thought worth merely the trouble of planting.

If, indeed, they are not worth the little additional care of pruning and cleaning, they are but cumberers of the ground. And both for appearance and use the soil had better be converted to some other purpose. For what is more unsightly than a neglected orchard! and as to profit,

one might as well keep a flock of scabby sheep, which can never come in contact with bush, or briar, or splintered rail, without leaving wool by the ounce behind them. A lean ox with a broken limb, fit neither for work, nor slaughter, is another emblem of neglected fruit trees.

The cultivation of fruit for the market is a minor object in parts remote from large towns. But in districts where good fruit would command a ready market and good price, there prevails an unaccountable inattention and indifference. On some farms, in a condition otherwise respectable, and with orchards of from one to two hundred trees, all that is obtained is about twenty barrels of cyder, a few barrels of eating apples, a bushel or two of pears, and a small quantity of the stone fruits. Again, on a few other farms with orchards of the same number of trees of equal age, the harvest yields ten times as much. Not that in the latter case the years wages paid out amount to a larger sum, or that more hands are employed.—But what hands there are, are better directed. The care of trees is considered by the proprietor an important branch of husbandry, and as such is attended to as systematically as any other branch. In truth the whole difference in the result of the year proceeds from this, that the farmer in the one case inspects his orchards carefully in the spring and puts them in order, while the farmer in the other throws away the same time in idle conversation or listless inaction, waiting for the frost to be gone and reserving all his strength for the plough.

The length of time required to bring fruit trees into a bearing state—the accidents to which they are liable—the uncertainty of the harvest—and the smallness of profit at the best,—these are thought, by many, sufficient objections to the cultivation of orchards, at least with any great degree of care.

The first objection may be answered by a direct appeal to the farmer's sense of interest. What, sir, will it cost

you to purchase and to set out your hundred young trees and to take proper care of them the first year? Will not your farm be worth the second, third, and fourth year and so on, as much more to sell, or to keep for yourself, or your children, as it will have cost you, in the mean time, to take good care of your young orchard? And when it shall have come into full bearing, at twelve or fourteen years, will you not be indemnified by the increased value of your farm, which a productive orchard will give to it? Will not your profit be fifty fold in proportion to your expense?

But, you say, your trees are liable to premature decay and to accidents? A thriving nursery, which costs little, will supply losses which care could not prevent.

Then comes the uncertainty of the harvest.—But what harvests are not uncertain? You toil and waste your strength in the corn field, and yet your harvest is uncertain. A bad fruit year comes, and a few days labor in pruning and cleansing your trees is all you can have lost.—Even this is not lost, for the quantity of fruit, even in a bad year, will more than pay you. Besides, commonly, the succeeding year is very abundant in fruit.

But there is the fourth objection—the smallness of profit. The word profit is a relative term. He, who gains ten cents on *one* dollar, makes a greater profit than he who gains five per cent. on one hundred dollars. Calculate what it has cost you to raise your orchard, and to make your cyder—to gather and barrel your fruit for the market, and if your cyder will bring but nine shillings the barrel and your fruit but two dollars, the absolute gain may be twenty per cent., taking the rent of the land employed into the account, although the whole amount received may not be a tenth part of the income of the farm. The probability is, however, that from a large stock of trees of various kinds of fruit, the profit may amount to a considerable sum, and thus from a very small original cost, the sales of fruit, may

come to be the principal income of a farm, in other respects in good condition.

In any part of the Commonwealth a fruit harvest from a good orchard, will pay a profit for consumption at home, if no sale can be made of it. The early *wind falls*, if not ripe enough for cyder and not used to make vinegar, will not be lost if thrown into the hog pen. The great tendency to heat in swine makes the acid of fruit grateful to the animal and useful to the carcase. If there is more fruit than the farmer can consume in his family, it will give him an opportunity to make a nicer selection for the cyder press, and thus to obtain cyder of a better quality. For in keeping the apples late, in order to mature them more perfectly before taking them to the mill, he need not be scrupulous in throwing out from the heap, for his hogs, all that are in the least decayed, as the cyder will not be so likely to have a flat taste, or be so liable to the acetous fermentation.

Besides the advantage of a wholesome and refreshing beverage which is yielded by the apple, it may, as an article of food, be made to form an agreeable and no unimportant part of the diet of a family. Other fruits in their season are entitled to the like recommendation.

It is as obvious, as striking, how much more moral, happy and prosperous our Commonwealth would be, were a general and simultaneous attention now given to the restoring of our old orchards and the planting of new ones on every farm where they are wanting! The debasing and wasteful habit of *rum drinking* would rapidly disappear with the increase of the crops, and proper exertions on the part of our Country Agricultural Societies, to diffuse the knowledge of the best methods of making and preserving cyder.

A full treatise on the subject of making and curing cyder may be found in a late number of this Repository.*

* Volume iv. page 170.

Also, in an earlier Number, the names and character of the best fruits of every kind cultivated in New-England.

ON THE MANAGEMENT OF FRUIT TREES.

[The following directions for the management of Fruit Trees, in every stage of their growth, will be found satisfactory.—They are from MARSHALL'S RURAL ECONOMY.]

A Seed bed and nursery ground should be kept perfectly clean, and be double dug, from a foot to eighteen inches deep. The seedling plants ought to be sorted agreeably to the strength of their roots, that they may rise evenly together. In transplanting, the tap or bottom root should be taken off, and, at the same time, the longer side rootlets should be shortened. The young plants should then be set, in rows, three feet apart, and from fifteen to eighteen inches asunder in the rows; care being taken not to cramp the roots, but to bed them evenly and horizontally among the mould. In strictness of management they ought, two years previous to their being transferred to the orchard, to be retransplanted into unmanured double-dug ground, four feet every way apart, in order that the feeding fibres may be brought so near the stem, that they may be removed with it into the orchard, instead of being as they generally are left behind in the nursery. Hence in this second transplantation, as in the first, the branches of the root should not be left too long; but ought to be shortened, in such a manner, as to induce them to form a regular globular root; sufficiently small to be removed with their plant; yet sufficiently large to give it firmness and vigor in the plantation.

If the raising or improving of varieties be the object in view, the nursery-ground should be naturally deep and

well soiled, and highly manured ; and the plants repeatedly moved at every second, third, or fourth year, that they may luxuriate not only in rich but in fresh pasturage ; thereby doing perhaps all that art can do, in this stage of improvement, toward giving freedom to the sap vessels, and size and richness to the fruit.

The intervals may, while the plants are small, be cropped with such kitchen-garden produce as will not crowd or over-shadow the plants ; the rows being kept perfectly free from weeds.

In pruning the plants, the *leading shoot* should be particularly attended to. If it shoot double, the weaker of the contending branches should be taken off. If the leader be lost and not easily recoverable, the plant should be cut down to within a hand's breadth of the soil, and a fresh stem trained. Next to the leader, the stem boughs require attention. The undermost boughs should be taken off by degrees ; going over the plants every winter ; always cautiously preserving sufficient heads to draw up the sap ; thereby giving strength to the stems and vigor to the roots and branches : not trimming them up to naked stems as in the common practice ; thereby drawing them up prematurely tall and feeble in the lower part of the stems. The thickness of the stem ought to be in proportion to its height, a tall stock therefore requires to remain longer in the nursery than a low one.

BEST METHOD OF PLANTING IN THE ORCHARD.

Describe a circle about five or six feet diameter for the hole. If the ground be in grass, remove the sward in shallow spits, placing the sods on one side of the hole. The best of the loose mould placed by itself on another side ; and the dead earth, from the bottom of the hole, in a third heap.

The depth of the holes should be regulated by the nature of the sub-soil. Where this is cold and retentive, the holes should not be made much deeper than the cultivated soil. To go lower, is to form a receptacle for water, which, by standing among the roots, is very injurious to the plants. On the contrary, in a dry light soil, the holes should be made considerably deeper; as well to obtain a degree of coolness and moisture, as to be able to establish the plants firmly in the soil. In soils of a middle quality, the hole should be of such depth, that when the sods are thrown to the bottom of it, the plant will stand at the same depth in the orchard, as it did in the nursery. Each hole therefore, should be of a depth adapted to the particular root planted in it. The holes ought, however, for various reasons, to be made previous to the day of planting. If the season of planting be spring, and the ground and the weather be dry, the holes should be watered, the evening before the day of planting, by throwing two or three pailfuls of water into each; a new but eligible practice.

In planting, the sods should be thrown to the bottom of the hole, chopt with the spade, and covered with some of the finest of the mould. If the hole be so deep, that with this advantage, the bottom will not be raised high enough for the plant, some of the worst of the mould should be returned, before the sod be thrown down.

The bottom of the hole being raised to a proper height and adjusted, the lowest tire of roots are to be spread upon it; drawing them out horizontally and spreading them in different directions, drawing out with the hand the rootlets and fibres which severally belong to them; spreading them out as a feather; pressing them evenly into the soil, and covering them, by hand, with some of the finest of the mould; the other tires of roots are then to be spread out and bedded in a similar manner. Great care is to be taken to work the mould well in, by hand, that no hollowness

be left. To prevent which, the mould is to be trodden hard with the foot. The remainder of the mould should be raised into a hillock round the stem, for the triple use of affording coolness, moisture, and stability to the plant. A little dish should be made on the top of the hillock, and from the rim of this, the slope should be gentle to the circumference of the hole, where the broken ground should sink some few inches below the level of the orchard. All this detail may be deemed unnecessary ; by those, I mean, who have been accustomed to bury the roots of plants in the grave digger's manner ; but I can recommend every part of it to those, who wish to ensure success, from my own practice.

Plants which have been transplanted in the manner here recommended, whose heads have been judiciously lessened, and which have been planted in the manner here described, seldom require any other stay than their own roots. If, however, the stems be tall, and the roots few and short, they should be supported in the usual manner with stakes, or, rather in the following manner, which is at once simple, strong, and most agreeable to the eye. Take a large post and slit it with a saw, and place the parts flat way, with the faces to the plant, one on each side of it, and two feet apart, and nail your rails upon the edges of the posts.

There are two ways of grafting. One is upon the stock, after two, three, or four years growth in the nursery. The manner is—to cut the entire head of the stock off and then to make a cleft in the top and insert the scions in it, covering up the whole crown afterwards with a composition. But this method is attended with this disadvantage, that should one of the grafts not take (two are usually inserted, one on each side) the cleft remains open, after the composition falls off ; and thus the cavity at the top on one side, not being filled up with new wood, becomes a receptacle for moisture and is very apt to decay.

The other method, and the best, is to let the stock remain until large enough to be grafted in the boughs, namely, until the trained boughs be about an inch in diameter.

By taking a view of the natural enemies of fruit trees, we shall be better able to judge of the art requisite to their preservation.

The enemies of fruit trees, are, a redundancy of wood ; moss ; spring frosts ; blights ; insects ; an excess of fruit ; old age.

Some of them are beyond human reach ; but most of them are within the control of art.

A redundancy of wood is the cause of numerous evils. The roots, or rather the pasturage which supports them, is exhausted unprofitably ; the bearing wood robbed of part of its sustenance, and the natural life of the tree unnecessarily shortened ; while the superfluous wood, which is the cause of this mischief, places the tree in perpetual danger by giving the winds additional power over it ; and is injurious to the bearing wood, by retaining the damps, and preventing a due circulation of air.

The underhanging boughs weigh down, especially when loaded with leaves, the fruit bearing branches they are preying upon, giving them a drooping habit, or at least preventing their taking, as they ought, and otherwise would, an ascending direction. While those, which grow within the head, are equally injurious in crossing and chafing the profitable branches.

The outer surface only is able to mature fruit properly. Every inward and every underling branch ought therefore to be removed. It is no uncommon sight to see two or three tires of boughs pressing down hard, one upon another ; with their twigs so intimately interwoven, that even when their leaves are off, a small bird can scarcely creep in among them. Trees thus neglected, acquire, through a want of ventilation and exercise, a runty, stunted, habit, and the fruit they bear, becomes of a crude inferior quality.

The great object of the fruit farmer is, to produce a crop every year; and nothing is more likely to obtain it than keeping the trees in perfect health, and endeavouring to prevent their bearing beyond their strength, in a general fruit year.

Moss is chiefly, perhaps, owing to the nature of the soil, and cannot be altogether prevented; but it may, in most cases, be checked, and its evil effects in a great measure avoided. I have seen several orchards in which the trees were almost entirely subdued by this vegetable vermin. Some of the trees, with, perhaps, only one bough left alive, and others entirely killed, and yet suffered to remain an incumbrance to the ground and a disgrace to the country. What avails the number of trees, if they are not productive? How absurd then to spare any reasonable expense to preserve them in a state of health and productiveness; or to suffer those to encumber the soil, which are past recovery.

Spring frosts are an enemy against which, perhaps it is most difficult to guard orchard trees. Dry frosts are observed to have no other effect than keeping the blossoms back; consequently are frequently serviceable to fruit trees. But wet frosts, namely, frosts after rain or a foggy air, and before the trees have had time to dry, are very injurious to the buds. An instance is mentioned, in which a flying hazy shower in the evening was succeeded by a smart frost; that side of the tree against which the haze drove, was entirely cut off; while that side of the tree which escaped the moisture likewise escaped the effect of the frost.

Much however may depend on the strength of the blossoms. The spring of the year, 1738, had its frosts; and all hopes of fruit trees were more than once given up; yet for quantity or quality taken conjointly, there has perhaps, seldom been so good a fruit year. But this year, the buds formed, and the blossoms broke forth with unusual vigour, and were enabled, by their own strength, to set common enemies at defiance. On the contrary, in the succeeding

spring, the blossoms sickened in the bud, the consequence was, that scarcely an apple succeeded.

The assistance, therefore, required from art, in this case, is, by keeping the trees in a healthful vigorous state, to enable them to throw out a strength of bud and blossom ; and by keeping them thin of wood, to give them an opportunity of drying quickly, before the frost sets in.

The term *blight* is of vague signification. Black blighting winds are talked of every where, but no definite idea is any where affixed to the expression. That corn and fruit become unproductive, without any visible cause, and that fruit trees are liable to be infected with insects, are certainly facts. But whether insects be the cause or the effect of blights does not appear to be yet settled.

With respect to blights, all the assistance, which art can render, is to keep the trees in a state of healthfulness, and prevent as much as possible an excess of fruit. As *old age* cannot be prevented, we have only to consider how the productiveness of trees may be protracted. I have seen healthy bearing apple trees, which now wear their second top. The first tops being worn out were cut off, and the stumps saw-grafted. Sometimes we see trees so far gone in decay, that their productiveness no longer repays their encumbrance of the soil ! How injudicious in such case is the conduct of the proprietor, who permits such trees to remain year after year imbibing and wasting the substance of his soil !

ABSTRACT OF AN ESSAY "ON THE ECONOMY OF FARM-YARD MANURE." By FRANCIS BLAIKIE, Published in London in 1818.

ON FARM-YARD MANURE.

FARM-YARD Manure has been aptly termed the Farmer's Sheet-anchor. The husbanding of it is imperfectly under-

stood, or not sufficiently attended to. One error in manufacturing of Farm-yard dung, is the keeping the dung of different species of animals in separate heaps, or departments, and applying them to the land, without intermixture and in an improper state.

The dung of cattle fattening is richer than that of lean ones. Hogs are of course more active in it, and turn it over more frequently. They continue longer at work upon it, leave of consequence more of their own manure, and it becomes more intimately mixed, and is proportionally increased in value.

The dung of store cattle is often very inferior, they being generally kept poor. Pigs have therefore less inducement to turn over their litter and dung. It is neither rich nor well mixed.

Horse-dung is usually thrown out in heaps by the side of stables. It is little spread. In such heaps it soon ferments and heats to an excess. The centre of the heap is burned or charred to a dry white substance provincially called "fire fanged."

During this state it loses from 50 to 75 per cent. of its value. Against this waste the diligent and attentive farmer should guard. The remedy is easy and not expensive. It is only not allowing this dung thus to accumulate, and removing it from the stable door and spreading it about the yards where the store cattle are kept. This can be done at spare time, occasionally, in job-work.

The hog-dung ought also to be carted from feeding hogsties, and spread over the store cattle yard.

The best form of a farm-yard is a little hollowing, ("dishing" as it is called) to the centre. Here the urine and drippings of the farm-yard concentrate. If the quantity be sufficient to pay for the expense, it is an excellent method, to throw it by means of a pump into water carts, and spread it over grass land. Or, litter, scourings of ditches,

and the like may be thrown into it for the purpose of absorbing the manure and wash. This forms an excellent dressing for permanent grass land, or for young clover lays.

The farm-yard should be considered always as a preparatory process to the dung heap. Into the farm-yard every thing should be brought in the course of the summer, which is calculated to be converted into manure. In it all descriptions of dung should be brought and blended together. Horse dung, where it is to be had, should be daily carted into the farm-yard. An abundant stock of pigs should be kept in them. No dry straw should be allowed to blow about the farm. Nettles, thistles, coarse weeds, *before they seed*, should not be allowed to die and waste on road sides and in ditches, after being cut down. Cattle should be fed in the yards, always in winter, and as much as possible in summer. The yard, barn, and sheds should always be kept well littered.—Soap lees of the farm-house—saw dust—leaves of trees—road scrapings—scourings of ditches, in short, all animal and vegetable substances, should be carefully collected and thrown into the farm-yard.

ON FORMING DUNG HEAPS, OR PIES.

When it becomes necessary to empty the farm-yard, either from the season, or want of room, or to expedite spring work, or to employ the teams in unfavourable weather, the following steps should be pursued.

1st, Collect large heaps of clay, marl, marsh mud, pond mud, or the like, and lay, in the first place, a bottom for your manure, as broad and wide as you may deem convenient, six or eight inches thick; and next, lay a large quantity of it in rows on each side of the bottoms thus laid out.

2d, Draw the dung out of the yards and place it upon these bottoms, driving the carts upon the bottoms and successively upon the deposits, for *at this stage the dung*

ought to be compressed together, so as that all fermentation may be prevented as much as possible. In taking the dung from the farm-yard, if it have not been previously mixed in the yard, it should be so, in drawing to the heap, by taking a few loads from one yard, or from one part of a yard, and then from another alternately. For it often happens that the dung is not of the same quality, nor made with the same regularity in all parts, even of the same farm-yard. Coal ashes, road droppings, and all other collections of manure should also be carried to the dung heap in the fields.

3d, One or two men (according to the number of teams employed and distance from the yards) should remain constantly at the heaps while the teams are at work, on purpose to spread and level the dung regularly, so as to render the ascent easy for the succeeding teams as they come with their loads.

4th, When the heaps are raised as high as convenient for the cattle to draw up, several loads should be tipped up at the ends of the heaps, for the purpose of making them up to the square of the centre. The whole heaps should then be completely covered with the clay, marl, mud, or soil, previously collected, in rows, by the sides of the heaps. If a sufficient quantity of materials for this purpose have not previously been collected, more should be got ready, without loss of time, so as effectually to inclose the dung heaps in a *crust*,—whence in England they are called *pies*. The dung will be preserved in such a pie, in a perfect state, with little or no fermentation, deterioration, or diminution, and without loss by exhalation or evaporation.

5th, The Pies should remain in this state, until within ten days or a fortnight of the time the manure will be wanted, when they should be turned carefully over, and the crust, top, bottom and sides intimately mixed with the dung. When the turning is completed, immediately plough several furrows of the natural soil all round the heaps, and with

the loose earth ploughed up, again coat the heaps all over ; the pies will then take a gentle fermentation ; the earth intermixed with and covering the dung, will absorb the juices, and gases of the dung, and the compost, come out in a state of fine preparation.

ON PREPARATION OF MANURE LATE IN THE SPRING.

When dung is taken out of the yards late in the spring, or only a short time before it is wanted, the preparation should, in some degree, differ from the foregoing.

The bottoms and sides of the heaps should be provided with earth, or mud as above directed, for the winter heaps, *but the dung should not, now, be carted on the heaps to compress them* ; on the contrary, the dung should be thrown up lightly with a fork upon the bottoms, and the side-heaps of earth mixed intimately along with the dung, which answer the double purpose of reducing the straw part of the dung to a proper state for applying to the land, and prevents an excess of fermentation in the centre of the heaps. When the heaps are raised sufficiently high to cover the square of the bottoms prepared, the natural soil of the field should be ploughed up all round the heaps, and thrown upon them, as above directed. The pies will then take a gentle fermentation and soon be ready for use.

The time required for preparing the manure in this manner must depend upon the strength of the dung and the quantity of clay, marl, mud, or earth, thrown up along with it. Experience will soon point out the proper quantity of marl, earth, &c. to be applied and the necessary time for the pies to remain before used. Turf turned up for a year preceding, on wastes, by the sides of roads, makes excellent pie meat. Good compost heaps applied to the land have the effect of renovating soils worn out by arable culture and stimulating manures.

[Communicated for the Massachusetts Agricultural Repository,
by A HORTICULTURIST.]

ON THE CULTURE OF GRAPE VINES.

MANY Gentlemen in this neighbourhood have given considerable attention to the cultivation of Grapes in the open air upon open trellises, and some have succeeded remarkably well, although they have had to contend with the many difficulties, which that delicate and delicious fruit is subject to in this climate.

Having given some personal attention to this fruit for several years, I am satisfied that it can be raised in great perfection, and with little trouble to the cultivator, if he set out right in the first instance, and follow up the system prescribed, with attention and care.

Although most men, who have any knowledge in Horticulture; know more or less respecting the mode of cultivating this plant—yet there are many new beginners, who may collect some hints from these notes, which may aid them in the outset; and many gentlemen, who have been long in the habit of raising grapes in their gardens, may obtain some information as to the means of preserving the plants from the destructive insect which has of late years attacked the vines, and destroyed the promise of their early growth and the fair appearance of their fruit.

The best treatises on the subject of raising grape vines, recommend planting the cuttings in pots,—but in this country it is entirely unnecessary, as the plants may be easily raised in the open ground with little trouble and no expense; and if we can add to our collection of fine fruits, one, which in sickness, as well as in health, is the most refreshing and nutritive of any that we possess, with little expense and even with profit to the cultivator, we shall do a great good.

The best mode of raising the plants is by cuttings taken from the vines at the Fall pruning, and preserved in earth till spring. These may be made either of one eye or bud, or of four or five, attached to a small portion of the two years old wood, forming a cutting in the shape of a small mallet.

The 1st year.—They may be raised in a small nursery bed, prepared of a good light soil—set in the ground six inches distant from each other, with the rows wide enough apart to permit them to be weeded with a narrow hoe; or, they may be put in the first instance, where they are to be reared, and left to grow, at the distance of five, six, or seven feet, or more according to the wishes of the cultivator. In this latter case there should be three cuttings put into each spot six inches apart, to insure the setting of one. When this is ascertained with certainty, the two weakest may be withdrawn, leaving the best of the three to grow. If the cuttings be of one eye each, they should be from the last years growth, and a small piece of the branch an inch long should be left attached to the bud and extending half an inch on each side of it.—These should be planted two inches below the surface with the bud uppermost, and a small stake placed by the side of them that they may not be disturbed. If the cuttings are of several eyes, they should be laid in the ground sloping, leaving one eye level with, or only just above the surface. They should be kept moist, but not wet, as this will rot them. A spot which receives the morning sun till eleven o'clock, and not afterwards, is the best for a nursery bed for them, but for permanency they should be planted where they will receive the sun longest, and in this case they should be shaded at noon day until they have entirely put out. One bud only should be allowed to push from the cutting the first year; the plant should be kept free from weeds; the earth kept light around it, and as soon as the shoot has attained strength enough to produce laterals, they should be rubbed out,

and the shoot tied to a small stake, by which means it will gain firmness, and the admission of the sun and air to the shoot will prepare it to bear the frost of the Fall, and prevent its imbibing the moisture which it would otherwise be subject to, when covered with earth in the winter. By the 1st Nov. the shoots may be cut down to two eyes, and by the middle of the month, if it be dry weather, they may be covered over with earth, forming a slope to cast off the wet and prevent the rains from penetrating—as the drier the plant is kept during the winter, in the better state it will be in the succeeding spring.

The 2d year.—The plants should not be uncovered in this climate till the middle of April.—Those from the nursery should now be transplanted to the places where they are to remain; a shoot from each eye should be permitted to push, but as soon as you have ascertained which of the two will be the strongest and the best situated, you will preserve that, and rub out the other.—The shoot preserved you will be careful to tie up to a small stake as soon as it has length enough for this purpose, to prevent its being broken by the wind or other casualty. During the summer, the laterals from the four or five lowest buds must be rubbed out, and the shoot be carefully protected by being kept tied every eight or ten inches.

The next Fall you may cut this shoot down to two buds, (not counting the one in the crotch of the plant between the old and new wood), and cover over as before.

The 3d year.—You will allow shoots to push from both the eyes, and suffer them to grow, taking care of them as recommended above; but the bud in the crotch must be rubbed out. This year you must rub out the laterals from the five lowest buds, and nip in the other laterals to one eye, so that if the plant grows luxuriantly the sap may burst from the buds of the laterals, and not from those of the main branch, as it would do if the vine was dressed too

close. Be careful to keep the branches tied up that they may not be broken. In November, cut down the two branches as follows : the most feeble of the two, to two buds, to produce wood branches the succeeding season ; and the strongest, to three buds, for fruit branches, and cover them as usual.

The 4th year.—If you keep your vines properly dressed, you may have your first fruits without injury to your plants. After this the system to be pursued must depend on the strength of your vines, and this will depend on the goodness of the soil and the care you take of your plants. But as a general rule, the following points must be attended to.

1st, The number and length of your fruit branches must always depend on the strength of your plant ; the wood branches are always to be cut down to two eyes.

2d, No more branches should be left on the vine than it can nourish well, and abundantly ; this will depend on its age, and the soil in which it grows.

3d, The branches should be cut in alternately for wood and fruit branches, observing to cut for wood branches as low down on the plant as possible, so as to renew your wood near the bottom annually. No shoots should be permitted to grow from the old wood, unless wanted for this purpose.

4th, No more shoots should be permitted to grow than can be laid in clear, and handsome, and without confusion on the trellis, and so as to admit the sun and air freely among the branches.

5th, The laterals should be rubbed out of the wood branches six or eight eyes high, and those that are permitted to remain should be pinched into one bud. The laterals on the fruit branches should be rubbed out from the insertion of the shoot to the uppermost fruit inclusive, and the others pinched in as above. If the shoots are *very* strong, the upper laterals may be allowed to grow, to take up a greater portion of the sap ; but this should not be

done unless there is danger of the eyes bursting in the main shoots. Be careful always to keep the shoots tied up near their top.

6th, Never leave more than five good eyes on a fruit bearing branch, unless your vine is confined to a narrow space, and you are obliged to preserve only two or three fruit branches; in this case the length of the branch must correspond to the nourishment it will receive from the plant. Select the roundest and fairest branches for fruit, and the lowest and most feeble for wood. The closer the buds are together, or the shorter the joints of the branch, the better they are for fruit; these may in general be cut to three, four, or five eyes according to their strength. But in vine-ries covered with glass, where two fruit bearing branches only are left on strong vines;—twenty, thirty, and forty buds are sometimes left on fruit branches.

The foregoing rules will be sufficient for any one to build up a vineyard sufficiently large to supply himself—his friends, and the market with grapes. But to promote and forward their maturity and size, the following course may be pursued.

The first of July you will be able to see the state of your fruit, which will be just formed.—At this time select the highest fruit branches and those which have the finest appearance of fruit upon them, and perform the following operation on the two years old wood, from which these branches proceed, taking care not to cut below any of the wood branches.

Take a pruning knife with a smooth edge, and hawk's bill, and pass it round the branch where the bark is clear from knots, cutting deep enough to reach the sap wood of the plant; at a quarter or 3-8ths of an inch below the first cut make another, running parallel with the first; then make a perpendicular cut through this section of the bark the same depth, and you may take out the ring of bark clear

from the branch. This will not prevent the sap rising into the upper part of the branch, but it will prevent its descending below this cut, by which means it will be retained in, and distributed throughout the upper part of the branch, in a greater portion than it could otherwise be, and the branch and fruit will both increase in size much more than any of those that are not thus treated, and the maturity of the fruit will be advanced very much.

This has been denominated *Girdling*. If the plant is very vigorous and the season very favorable, the wound will soon be closed, so that it may be necessary to open it a second time. This process does not injure the plant, as you only girdle the fruit bearing branches, which you would in any case cut out at the Fall pruning, to make room for the branches which you have been bringing forward to give you fruit the succeeding year. This may be kept up from year to year, and give you a succession of ripe fruit from the 1st of Sept. to the close of the season. The fruit on those branches which are not girdled will ripen the latest of course, but neither these, nor those which have been girdled, should be shortened, as is customary on vines not thus treated.

By this practice, which was first suggested in the transactions of the Horticultural Society of London a few years since, and first brought into use in this country with success by the corresponding secretary of your society, I have raised grapes in the open air this year, the bunches of which weighed from eight to twenty eight ounces; and the berries measuring from two to three inches in circumference. On one vine which I planted a few years since *a cutting* in the spot where it now grows, I had seventy branches of fine chasselas, weighing from eight to eighteen ounces each.

But the grape vines have of late years been attacked by a small insect which makes its appearance first in June—

but is most abundant in August. This insect, if left to increase, destroys the vegetating principle in the leaf, and the plant languishes, the fruit mildews, and the labour and care of the cultivator is lost. Some gentlemen have abandoned their vines in consequence of the depredations of this insect, and others with great labour, and expense of time, have attempted, but in vain, to destroy them with alkalies and tobacco juice. This has to be sure operated to check them partially, but not effectually. To remedy this evil you have only to make a small light frame twelve or fourteen feet long, in the form of a soldier's tent—but with hinges of leather where the top joins so that this tent may be shut up, or opened at the bottom to any width you may require, according to the height of your trellis. This light frame, which should be made of slats of boards from one to two inches broad, may be covered with an old sail, or some cheap glazed cotton cloth which will stop the smoke, leaving cloth enough loose at each end, to close over, and prevent the smoke from escaping when the tent is spread over the trellis.

A few tobacco stalks moistened and put on some coals in a pan, will be sufficient to smoke the vines thoroughly; and as the tent is easily moved along the trellis on small wheels, one man may, in a few hours, extirpate this enemy of the vineyard. Vines that are already attacked by this insect to any great degree should be smoked in June, July, and twice in August, or oftener if you find the insect is not completely destroyed.

The insects are first seen on the under part of the leaf, without wings—very active but easily destroyed if touched. They afterwards assume the winged state, when it is very difficult to get at them, as they fly off on the vines being touched. They are yellow, striped with brown across the back. The moment the smoke ascends, the winged insects quit the leaves and fall to the ground dead or alive; the young

ones perish, but the older ones will revive if not destroyed in their torpid state. To effect this, you have only to cover the ground under the tent with a piece of wet cloth before you begin to smoke, to which they will adhere until the tent is removed, and they are revived by the atmospheric air; to prevent which you will roll, or twist, the cloth each time that you remove the smoke house, or tent, and replace it again each time before you smoke, by which means they will be effectually destroyed. This simple and cheap operation will keep your vines clear of this troublesome and destructive insect, and you may, if the season be warm, insure a good harvest; if otherwise, you will be sure, if the vines be girdled, to ripen a portion of your fruit, at least.

ALMS-HOUSE FARM AT SALEM.

[Communicated for the Agricultural Repository.]

THE subjoined official communication is a document, which will be of use beyond the narrow circulation of this Journal. The political economists of all civilized communities will find in it a treasure. The design of it is not to present a project to be discussed, but to give a narrative of a project crowned with success. The inference from it is—*go and do likewise*. The agriculturist may rejoice, that his favourite pursuit promises to be the means of correcting one of the most formidable evils, with which society is afflicted. Mr. Upton, who has been, from the beginning, the conductor of the Salem Alms-House Farm, is a man of singular capacity and uncommon qualifications, and the credit of what has been accomplished undoubtedly belongs to him. And we must pay him the compliment to say, that the strongest objection to the general adoption of his plan for the poor, seems to be the difficulty of finding such men

to take the management. It ought, however, to be considered, that, in the order of providence, examples like him, of great usefulness, are not lost upon the world—that merit of any kind naturally propagates itself. Neild, Bentham, Frye, and twenty other philanthropic prison-reformers are all children of the enterprising and benevolent Howard. No sooner is the world visited by a new combination of intellectual and moral qualities in any individual, than the same character is seen to develope itself in others, and to show itself in action. Mr. Upton will have the honor of having shed new light upon the interests of society, but there is capacity, disposition, and energy enough in the civilized world, to give him a multitude of successful fellow-labourers, in his great work of bettering the condition and reforming the habits of the mendicant poor. The instinct of interest, if not the power of benevolence, will be strong enough in the public, and sufficiently active in a concern so momentous, to bring into exercise all its sagacity to discover Mr. Upton's kindred spirits, whom the success of this distinguished man, and the state of society, will have created and prepared for exertion.

We have not learnt whether Mr. Upton has as yet adopted any plan for instructing the young at the Alms-House in school learning. But there is something so nearly resembling his general views in the plan pursued by Mr. Fellenberg at Berne, in Switzerland, on a farm devoted to the support and education of mendicant children, that it may be useful to transcribe an account of it, in the language of Mr. Brougham's evidence before the Education Committee of the British Parliament. We cannot but hope, that the Boston Society for the protection of Orphan Boys, as well as the Inhabitants at large of the metropolis, will have bestowed some attention on this statement, which they may have seen in other publications. We should be extremely sorry to discredit the plan of Upton or of Fellenberg, by a premature

recommendation, or by urging its adoption, where it might, from any cause, be impracticable,—but supposing the question of a proper provision for and management of the poor now open, whether for Boston, or other towns, for any part of this or any other civilized country, and we may say, with some confidence, that more aid will be derived from Fellenberg and Upton, in forming the least exceptionable plan, than from all that has been thought or done by the whole world besides.

“The branch of the establishment, however, which is more particularly deserving of attention, and with which all the others are more or less connected, is the seminary for the Poor. Mr. F. having long remarked the extreme profligacy of the lowest orders in the Swiss towns, and the habits of ignorance and vice in which their children were brought up, formed, many years ago, the design of attempting their reformation, upon principles equally sound and benevolent. His leading doctrine was, that to make those poor people better, it was necessary to make them more comfortable; and that this end would be best attained by forming, in their earliest years, habits of industry, which might contribute to their subsistence; and by joining with them a greater degree of intellectual cultivation, than has ever yet been extended to the labouring classes of the community, or been imagined to be compatible with their humble pursuits. He began his experiments upon a small number of children, which he has now increased to between thirty and forty; and this may be reckoned the utmost limit upon a farm of so moderate an extent. Those children were taken from the very worst description of society—the most degraded of the mendicant poor in Berne and other Swiss towns. With hardly any exception, they were sunk in the vicious and idle habits of their parents, a class of dissolute vagrants, resembling the worst kind of gipsies. The complete change that has been effected in them all, is one

of the most extraordinary and affecting sights that can be imagined. When I saw them, there were some who had been there for several years, and had grown up towards manhood ; but the reformation in almost all took place during from one to two years, or a very little more, according as they were taken at an earlier or a more advanced age. The remark which I made, is that which immediately strikes all who visit Hofwyl ;—the appearance of the children alone, their countenance and manner, impresses you with a conviction of their excellent dispositions. To describe all the steps of the process by which this reformation has been effected, would be impossible, as much depends on minute circumstances, and upon the great skill and judgment of Vehrli, a young man, who has devoted his life, under Mr. Fellenberg, to the superintendence of this part of the establishment, and to whose extraordinary virtue and ability its success is principally owing. But I shall endeavour to give the Committee some idea of the mode of treatment pursued.

“The first principle of the system is, to shew the children gentleness and kindness, so as to win their affections, and always to treat them as rational creatures, cultivating their reason, and appealing to it. It is equally essential to impress upon their minds the necessity of industrious and virtuous conduct to their happiness, and the inevitable effects of the opposite behaviour, in reducing them from the comfort in which they now live, to the state of misery from which they were rescued. A constant and even minute superintendence, at every instant of their lives, forms of course part of the system ; and, as may easily be supposed, the elder boys, who have already profited by the care of the master, aid him in extending it to the new comers, who for this purpose are judiciously distributed among them. These are, I am aware, very general principles ; and upon their judicious application to practice, in each particular in-

stance, according to the diversities of individual character, their whole virtue depends. But a somewhat more specific notion of the plan may be formed by observing, that it is never allowed for a moment to be absent from their thoughts, that manual labour, in cultivating the ground, is the grand and paramount care which must employ their whole lives, and upon which their very existence depends. To this every thing else is made subordinate ; but with this are judiciously connected a variety of intellectual pursuits. At their hours of relaxation, their amusements have an instructive tendency ; certain hours are set apart for the purposes of learning ; and while at work in the fields, the conversation, without interrupting for a moment the necessary business of their lives, is always directed towards those branches of knowledge, in which they are improving themselves during the intervals of labour. Beside writing and ciphering (at which they are very expert), they apply themselves to geography and history, and to the different branches of natural history, particularly mineralogy and botany, in which they take a singular delight, and are considerable proficient. The connexion of these with agriculture, renders them most appropriate studies for those poor children ; and as their daily labour brings them constantly into contact with the objects of those sciences, a double relish is thus afforded at once to the science and the labour. You may see one of them every now and then stepping aside from the furrow where several of them have been working, to deposite a specimen, or a plant, for his little hortus siccus, or cabinet ; and Mr. Fellenberg rarely goes into the field where any of them are labouring, without being called upon to decide some controversy that has arisen upon matters relating to mineralogy, or botany, or the parts of chemical science which have most immediate relation to agriculture. There is one other subject which is ever present to their minds ; I mean a pure and rational theology. Mr. F. is deeply im-

bued himself with the sense of religion ; and it enters into all his schemes for the improvement of society. Regarding the state of misery, in which the poorest classes live, as rather calculated (if I may use his own expression) to make them believe in the agency of a devil than of a God, his first care, upon rescuing those children from that wretchedness, is to inspire them with the feelings of devotion, which he himself warmly entertains, and which he regards as natural to the human heart, when misery has not chilled nor vice hardened it. Accordingly the conversation, as well as the habits of the poor at Hofwyl, partake largely of religious influence. The evidences of design observable in the operations of nature, and the benevolent tendency of those operations in the great majority of instances, form constant topics of discourse in their studies, and during the labours of the day ; and though no one has ever observed the slightest appearance of fanaticism or of superstition, against which, in truth, the course of instruction pursued is the surest safeguard), yet ample testimony is borne by all travellers to the prevailing piety of the place. One of these has noted an affecting instance of it, when the harvest once required the labourers to work for an hour or two after night-fall, and the full moon rose in extraordinary beauty over the magnificent mountains that surround the plain of Hofwyl. Suddenly, as if with one accord, the poor children began to chant a hymn which they had learnt among many others, but in which the Supreme Being is adored as having ‘lighted up the great lamp of the night, and projected it in the firmament.’” *Edin. Review*, No. LXI p. 156—158.

“The grand principle of this Institution is, that every thing must be kept subordinate to the main business of cultivating the ground ; that whatever else can be learnt by the boys is so much clear gain ; but that, before every thing, they must learn to support themselves by the labour

of their hands. Of this occupation a pleasure is made, by the agreeable course of amusement and instruction with which it is combined." *Edin. Review*, No. LXI. p. 159.

Salem, 17th Dec. 1819.

E. H. DERBY, ESQ.

DEAR SIR,

THE following statements respecting the farm connected with the Alms-House in Salem, are communicated to you by order of the overseers of the poor, in compliance with your request. They have been collected from Mr. Upton, to whose fidelity, ability, and prudence, as the manager of the house, and experience and skill, as a practical farmer, the town owe any success, which may have attended this attempt, to cause the labours of the poor in agriculture, to contribute something towards the support of an establishment, which exists for their benefit.

In the year 1815, the Work-House in Salem having been found insufficient for the accommodation of the increased number of the poor, and not well adapted for carrying into effect certain improvements in the system of management, which it was then thought expedient to adopt, the town determined to erect a more spacious building for that purpose. Upon a tract of land, called the Neck, about a quarter of a mile eastward of the compact settlement, a suitable site was prepared for the New Alms-House, and as the property of this land was in the town, the overseers of the poor were authorised to enclose a portion of it, and manage it as a farm for the benefit of the poor. This land had been cultivated by the first settlers of the town, but certainly had not been broken up for more than an hundred years, and was like the well known tract of land westward of the town, waste, uneven, and rocky.

The New Alms-House was completed in the Autumn of 1816, and the poor removed into it in the winter of the same year, during which they were employed in clearing and levelling the land, adjacent to the house ; in building wall, opening roads, and other labour necessary to render the house and grounds about it convenient for the uses of an Alms-House. But no progress was made in the actual cultivation of the soil, which remained in the same state with other waste land.

In the year 1817, about eighteen acres of land were broken up, the produce of which was as follows :

Pork raised, 4391 lbs. of which 2000 lbs. sold for \$280.

Turnips 1000 bushels.

Potatoes 2700 bushels, of which 422 bushels were taken from 3010 Hills, planted in the usual manner.

All the Summer vegetables used in the house.

An account of the produce of the year 1818, has already been given with sufficient accuracy in the Journal of your Society, but to comprise all the facts relating to the subject in this paper, you may not think it amiss that it is here repeated.

This year about seventeen acres were broken up, making the tillage land about thirty-five acres.

1818.

Pork killed, weight 7960 lbs.

Twelve Live Pigs sold for \$42.

On hand 57 Pigs.

Corn 400 bushels.

Potatoes 2250 bushels.

Turnips 900 bushels.

Three tons Squashes.

Fifty tons Pumpkins.

And all the Summer vegetables necessary for the Alms-House.

In the present year, 1819, about fourteen acres more of land have been broken up and cultivated, and about the same quantity has been laid down to barley and grass; so that the acres of land actually in tillage have been nearly the same this year, as they were the last.

The produce of this year is as follows:

1819.

Pork already killed 9012 lbs.

28 Hogs to be killed this season, and will now average over 250 lbs.

A few live Pigs sold when small.

73 live Pigs on hand, to be kept over, now average over 170 lbs.

Corn raised 325 bushels. Turnips raised 250 bushels.

Barley 235 do. Pumpkins 48 tons.

Potatoes 3123 do. Squashes 22 tons.

Onions 225 do. Broom Corn sufficient to make 100 dozen of Brooms.

Beets, Carrots, Cabbages, &c. sufficient for the Winter, and all Summer vegetables in abundance.

When the farming commenced there was not a load of manure of any kind on the place. In 1818 two hundred cords of manure were made, and during the present year the quantity will be very considerably greater. The farm being situated on the sea-coast, has a great advantage over such as are inland in regard to this important material of husbandry, as great quantities of sea-weed, rock-weed, and muscle-bed, can be collected in its immediate vicinity with little trouble.

The management of the farm has been conducted on the system of husbandry commonly adapted on the farms of Massachusetts, and the tools used of no unusual construction. The stock kept on the farm consists of three yoke of working cattle, two horses, and five cows.

I know of nothing further of importance properly relating to the history, management and products of the farm. But there are some facts necessary to be stated to enable you to form a correct estimate of what may be expected from this establishment, which, though not included in the terms of your request, or essentially connected with any of the objects of your society, I beg your indulgence briefly to mention. Within the last eighteen months a wharf has been built near the Alms House by the labour of the poor supported by the town, with the occasional assistance of one, and sometimes two hired men, who during this period were employed in the service of the house and farm. This wharf covers about an acre of ground, is of an average depth of seven feet, has about twelve feet of water in front, at high tide, and is constructed in the best manner of solid granite, and gravel. The rock and gravel were taken from the town's land in the vicinity, where they are found in great abundance, and may be made a source of considerable profit to the town. This wharf is very convenient for landing the wood and other heavy articles purchased for the use of the poor, and will save the town a large bill of expense, heretofore incurred in carting from other wharves. The labour bestowed upon this wharf which greatly exceeds the calculations made at its commencement, has not a little retarded the progress of cultivation upon the farm. The past summer, a large Piggery has also been built in the vicinity of the house, the construction and arrangement of which have been commended by experienced agriculturists, who have visited the place. Besides performing the necessary labour of the farm and completing the wharf, the teams belonging to the house have earned, since harvest of the present year, about 900 dollars, in carting gravel and rocks for individuals, and in working upon the highways. Since 1817, about a mile of excellent road has been made about the grounds, by the poor.

In addition to the labour of the farm, the inhabitants of the Alms-House are employed in spinning, weaving, coöpering, the manufacture of small articles of cabinet-furniture, making the wood work of all the tools used on the farm, corn brooms, &c. &c.; it being always a principal object with the overseers to give as much of an active character to the employments of the poor, as the age, strength, and general habits of the persons to be employed will admit.—The shoes worn by the tenants of the Alms-House have, from the commencement of the establishment, been made there, without the purchase of a single pair. Much of the cloth worn is manufactured there, and all the cloths are cut out and made in the house. The employment of *pick-ing oakum*, which is a principal occupation in many Work-houses, is here restricted to those who are confined to their rooms by age and infirmity, or are otherwise actually incapable of hard labour.

How far the farm connected with our Alms-House can be depended upon to diminish the charges of the support of the poor, cannot at present be determined with sufficient accuracy. The expenses attending the commencement of such an establishment, particularly on land in so wild a state, the cost of tools, extra labour, and many others, which will readily occur to every farmer, are so considerable, that the net profits of the farming of the past and present years should by no means be taken as a fair estimate of the value of the establishment in a pecuniary view. The products of succeeding years will doubtless be more valuable and abundant, and the expenses less; so that a material reduction of the town expenses for the support of the poor may reasonably be expected from this source.

It is well known that a principal embarrassment in the management of the poor, arises from the difficulty of providing suitable employments for them; and this is especially true of those establishments, in which, as in most of

the Work-houses in Massachusetts, the Alms-House and the Bridewell are united. If our farm should be found in a great measure to remove this difficulty, by furnishing, in its various details of labour, employments suited to all classes, ages, and sexes of the poor, and rendering them more industrious, contented, healthful, and happy, than they can be made in the usual employments of such houses, then certainly the labour and expense it has required, could not have been better bestowed. When enlarged, as it may be, to embrace all the operations of husbandry, the poor may be made to depend principally on their own labour in a salutary and honourable occupation for their support.— Let it be once settled, that all who are admitted into this Alms-House will be required to work with constancy and diligence, and few of the idle, or dissolute will incline to become its inhabitants. Thus the common stock of labour and industry will be increased, and our institutions for the support of the poor, instead of being the means, as many political economists have supposed, of promoting indigence and idleness, will have a direct and certain tendency to suppress them.

In behalf of the Overseers of the Poor,

I am, respectfully, your most obedient servant,

J. G. KING, *Secretary of the Board,*

Jamaica Plain, 17th Dec. 1819.

[To the Corresponding Secretary of the Massachusetts Agricultural Society.]

DEAR SIR,—I was induced two years since to raise a small plat of *Mangel Wurtzel*, in consequence of having read in the 5th vol. of the Bath Society's Papers, and 3d

vol. of the Memoirs of the Philadelphia Society, such flattering accounts of its produce. The seed I procured in 1818, was from two sources, and produced two kinds, one nearly round like the turnip and yielded a very small crop—the other was long like the beet, and grew much out of the ground, and did not attain much size, and were almost as red as the common beet (probably the roots from which the seed was raised, had been planted near beets and caused a mixture.)

I was not deterred, however, from again trying it this season; and planted about one quarter of an acre, with seeds raised by myself, in 1818, from selected roots given me by a neighbour, the produce of them very much resembled the common beet, the leaves of many being a very deep red; the land was cultivated the year before with potatoes, and in April last was well ploughed and harrowed, then furrowed with a double mould board plough, 24 to 27 inches apart—and old rotten manure spread in the furrow, and the soil returned by the same plough—the top of the ridge was then flattened and the seeds drilled singly at 9 to 12 inches apart; the produce of this spot was about 120 bushels, many were marketed from them in thinning out and thought as good as young *beets*, and were double their size early in the season.—Produce near 500 bushels per acre.

Adjoining this piece, six rows (about one seventh part of an acre and with the same cultivation,) were planted with seeds of *Mangel Wurtzel*, just then received by me from Holland, the plants of the same were all handsome, leaves light coloured, and roots more than double size; on the average, produce about 110 bushels, making near 800 bushels per acre—the same care and attention was paid to both, and I attribute the whole difference to the *purity* of the seed.

This plant is not subject to injury from insects—requires very little labour after first weeding and thinning out extra plants, except what was done with the plough—three times

during the season—the leaves soon cover the ground and prevent the growth of weeds—the *outside* leaves may be frequently broken off and given to *Cows* and *Hogs*, they are very fond of them, and excellent to produce milk,—and will abundantly, I think, pay for the labour of cultivation during the Summer and leave the roots clear.

They should be planted as early as the land can be well prepared to receive the seed. I intend to increase the cultivation of them the next year, having sent to Holland for a supply of *pure seed*,—and have selected several bushels of the best raised by me this season; to any gentleman wishing to raise the seed next year, I will give the roots with great pleasure.

I also intend to cultivate the *Ruta Baga* more largely than I have yet done, all animals are fond of and thrive upon it, the roots keep better than any other vegetable (except the potatoe,) and I do not find the milk of cows, fed with it, taste so unpleasantly, as when fed with the common turnip. Joseph Marshall in his *Agricultural Tour through Sweden, &c.* in 1770, says, *Professor Linnaeus* told him, it was not injured if left in the ground all Winter, even in that climate, when the earth was frozen three feet deep. It did not with me this year, however, yield more than half as much as Mangel Wurzel per acre.—This root deserves, however, to be extensively cultivated, its produce may generally be calculated double to the potatoe—no more labour in cultivation, and much less in harvesting the crop; the time of sowing is after all other planting is done—and if the plants are raised, will do well to transplant on ground that has produced early pease.—This transplanting, however, should be done as soon as possible after ploughing or ridging the earth, in rows, about two and a half feet apart, and about one foot from plant to plant—having some good old manure under the furrows. I am, Dear Sir,

Respectfully yours,

JOHN PRINCE.

Brighton, 29th Dec. 1819.

ON DAIRY STOCK.

DEAR SIR,—The deterioration of the dairy stock of our country having become apparent to many, the subject may be deemed of sufficient consequence to merit investigation. A residence of twenty-five years in the vicinity of the great *Cattle Mart* of New-England, has furnished me with opportunities of frequent observations, and also, of collecting the opinions of intelligent Drovers and Graziers, from almost every section of the country, who attend the weekly fairs; where it is estimated, forty thousand head of neat cattle, and one hundred thousand sheep are annually vended,—and the result is, a confirmation of the position—but proof of a more plenary character may be adduced; and that is the enhanced price of this species of stock, when it is considered that the causes which have heretofore operated to increase the price of working and beef cattle, could have but little effect on cows suitable for the dairy,—for when a good *Milch Cow* will sell for as much as a good *Fat Ox*, of weight, exceeding that of the Cow when fattened, which has been the case for a number of years past, it may be presumed that few are slaughtered; and it will be shewn in another place, that an ample supply of heifers are raised, did they possess the requisite *physical* properties. The question will naturally arise, and which must be familiar to those who have frequented the Brighton Fairs of late years, “what is the cause that there are so few good Milch Cows in the country?” Before we offer a theory on the subject, to shew the causes which may have produced this deterioration, we may be allowed to observe, that Cows, in their wild state, afford no more milk than is necessary to nourish the calf, with the assistance which he soon begins to derive from the herbage. And that a stock *valuable for the dairy*, is the effect of long habits of domestication, of plenty of succulent food, of com-

fortable shelter in cold climates, and of great care to prevent a mixture of other breeds. The present race of cattle can be traced, with few exceptions, to the original stock introduced by our ancestors at a very early period of our history ; and it is said they came principally from Devonshire, where, at this day, is a breed celebrated in Great Britain, for beauty of form, and as valuable for the yoke ; and it is probable that in the selection, properties for the dairy were not much considered—but the peculiar circumstances under which the country was settled have led to a system of management, and which has continued to the present time, by no means favourable to the increase of dairy stock. Cattle have constituted the principle staple of the new settlements, and as these extended, and the population of the old towns increased, the profit of consigning the calves to the butcher, and purchasing heifers, has been too tempting to be resisted, and the practice has increased in some sections of the country, so as to become very general. What is the system of management in the new settlements, and which may possibly be continued in some of the old ? The young cattle are, with few exceptions, without any kind of shelter during the whole of our severe winters. They are foddered with poor hay, straw and husks, and suffered to browse in the woods,—and in the spring, become so feeble that they can barely crawl up the hills, to crop the honeysuckle clover, this luxuriant herbage soon restores them. They are brought from the pastures in fine condition, having obtained good size, and many of them beautiful forms, but they are to undergo another pinching winter ! Better enabled, however, to struggle through the snow drifts, by an increase of bone and muscle, nature has furnished.—But this is all she can do,—neither is it necessary for her purpose, to expand the milk vessels ! Can it be expected, under such a course of treatment, of the race, for nearly two centuries, but that the organs for the secretion of milk,

will become diminutive? and it is well known, that when that is the case, any excess of feeding will add very little to the quantity of milk, though it may fatten the animal,—yet it is from such a stock, that we in a great measure depend, for a supply of Milch Cows.—But another cause may be assigned, and which will be considered, perhaps, by those acquainted with the physiology of animals, as having much greater influence than people are generally aware of, and that is, in the selection of *Bulls*, most farmers confine their attention to *form and colour only*, instead of tracing their descent from a *valuable dairy stock*. It has been observed by Linnæus, that those properties of animals which relate to the *vessels*, or, in scientific terms, “the *cortical substance* or *vascular system*, are derived from the *male*,” and among other examples tending to confirm this opinion, he states, “that a cross from the male Angora Goat, with the common female Goat, produces that fine wool, or substance, called *Camel’s hair* ;* but that the progeny from the male common Goat with the female Angora, is productive of nothing but the same worthless hair of the sire.”† Should the committee view the subject as deserving attention, they will, I trust, require from the claimants for premiums on imported stock, very particular and well authenticated evidence, of their descent from a pure dairy race.

The system of management, that has been detailed, in its consequences, extends to another object, which may be deemed of importance, and that is, the premature slaughter of vast numbers of heifers, that are turned off by the farmers as affording no promise for the dairy ; many thou-

* Gorham Parsons, Esq. has a stock of Goats produced by the male Goat of Angora, from the female common Goat, that uniformly afford *Camel’s hair*, which is allowed by the manufacturers to be equal, if not superior, to that imported from Smyrna. Such a stock must be highly valuable in the southern and western States.

† See dissertations on the Sexes of Plants, by Linnæus.

sands of them being sold every autumn at the fairs, and if the inspection laws are not evaded, are packed and sold for beef of a very inferior quality, whereby the reputation of that staple is injured in foreign markets. To provide a remedy in some measure for this loss of capital to the state, and of profit to the farmer, would it not be expedient to offer premiums for *spayed* heifers? and also for a practical treatise on the mode of operation? The English writers on the subject, whom I have had an opportunity to consult, observe, "that there can be no doubt, but the notion of injury being done by the operation, is wholly erroneous, or without any foundation from correct observation; that the chief reason why a practice so beneficial to the interest and advantage of the farmer has been so little attended to, is the difficulty of procuring expert and proper persons to perform the operation, which is, in itself, simple;" they also observe, "that less food is required to keep or fatten them than oxen, and that the quality of the beef is fully equal." Mr. Marshall in his "Rural Economy of Yorkshire," remarks "that it is a fact well established in the common practice of that district, that *spayed* heifers work better and have more wind than oxen."—And I have been informed by an English farmer, who used them in the state of New-York, that they bear the heat of the climate much better than oxen,—and on the farm or road, are as active as a horse-team. Could they be substituted for horses, in those employments, what an immense saving of capital!

I remain,

Dear Sir,

With respect, very cordially yours,

S. W. POMEROY.

HON. JOSIAH QUINCY,
Chairman of the Committee on Premiums.

ON THE MANAGEMENT OF ORCHARDS.

[To the Corresponding Secretary of the Massachusetts Agricultural Society.]

THE zeal which has of late been manifested in effecting more beneficial modes of culture of our annual crops of grain and other vegetables, the science and economy so usefully inculcated and observed in preserving, and in applying the multiplied discoveries of the means of stimulating vegetable growth and increase, as well as the spirit of improvement in the general implements of agriculture, cannot fail to advance the interests of the country, and afford a lively gratification to the agriculturalist.

There is an object of culture, however, the advantage of which, if not so immediate, or even necessary, yet adds much to the comfort, happiness, and wealth of the farmer, and may be considered his proper pride and luxury—the apple tree.

There is a moral consideration, which should induce an attention to this subject, in the opinion held by many, that cyder should supersede, and is the best substitute for spirituous liquors.

Taken as a luxury of our table, as furnishing an excellent drink, as it were the wine of our country, or as an article of export; the apple stands foremost in the fruits of New-England. It should not be forgotten, that of late, in addition to the usual markets, a very great export has taken place to Europe, and that the flavour of our apple is highly estimated there.

It may be useful to inquire what is the condition of our orchards? are they not in a state of decline? what are the causes? and how to be obviated? But most of all, it will be of great importance, if more attention can be excited to this subject, so as to encourage communications from the experience of our intelligent farmers; or if any hint should be suggested herein, by which, those disposed to add a

fruitful orchard to their farms may find aid or encouragement.

As to the state of our orchards, it is believed from a careful inquiry, that in those parts of the Commonwealth longest settled, they are on the decline. Among the causes that have induced this, besides the natural decay of old orchards, and the neglect to set out and bring on new ones, may be mentioned—the desolating canker worm, the caterpillar, and the boring worm, at the root. The blowing down of a vast number in Norfolk and Bristol, particularly in the September gale, in 1815, and the great injury done some years since, by the formation of ice upon trees, whereby they have been overburthened and broken down; all these causes have conspired to diminish the number, more than is at present apprehended.

From experience and observation, it will, it is believed, result, that even though there may be some life and vigour in those trees which were hoisted and propped up; yet they will give but little fruit, and pass into premature decay. The breaking off the great lateral roots is generally a decisive injury to the tree, besides exposing it to blow over, whenever its props become weak, insecure or displaced.

In obviating the evils which beset our trees, the modes are various, and require great labour and application. They are too often abandoned to the canker worm and caterpillar, to the total loss of fruit and foliage. Thus the tree being exhausted by putting forth its leaves twice a year in an annual recurrence, becomes exhausted, unhealthy, and is often totally destroyed.

Many preventatives to the ravages of the canker worm have been practised. The use of tar is most frequent and effectual.—But as it injures the tree by its heating and binding nature, it would be very desirable for the fertility and vigour of the orchard, if some more easy and less in-

jurious mode could be suggested. As to the caterpillar, whenever the tree is bare of leaves, and the eggs can be discovered and destroyed, which is practicable upon low and small trees, it is most effectual. A flapper is used by some, dipped in fish oil and applied to the nests, but the removal of them by hand, though slow, has, when the caterpillar is in the nest, been of necessity the prevailing practice. It is, to be sure, slow, and it is to be wished a better mode might be suggested. The injury done by the worm, which perforates and bores its way into the centre of young apple trees, threatens great injury, and one of our Trustees (Mr. Prince), has practised a mode of destroying it in the tree, by the insertion of a wire, as described in the last number of this Repository. But it is to be hoped that some application at the rim of the tree, near the root, may be found out, which may prove obnoxious to the insect which deposits the egg, and remove the apprehension and alarm excited by this last enemy. The decay and other injuries mentioned, whether natural or accidental, are such as cannot be guarded against in any considerable degree. The prudence and good management of our farmers will always effect something. If then, our orchards are on the decline from age and other circumstances, and we have been inattentive to bring forward a new growth, would it not be useful to turn our attention to this subject. The value of the fruit should induce the culture of the tree.

The situation for an orchard is well understood by our farmers, it flourishes best in a moist and strong stony soil, where it is not exposed to the wind. It cannot be attempted with success to bring forward an orchard in an old field, a green sward, or an exposed state, to be rubbed against by cattle.

It is, however, more easy than is generally supposed, to overcome many natural disadvantages, and an orchard may

be brought forward, and made productive in a few years, in a situation (when wished) not so favourable. To shew this, two cases will be mentioned which have been attended with good success.

In the one, a low piece of strong stony land was taken. As it was rather flat, it was ploughed in strips, or dug in spaces about four feet square. As it was necessary to plough a furrow between each row, the mode of ploughing in strips was found the best, as by turning the furrow towards the tree, the land was better drained. Besides raising the ground a little from the surrounding soil, half a buckload of loam was added to raise the ground on which the tree was set. After this was done, the strips or squares, as the case might be, were appropriated to the culture of potatoes and garden vegetables. In a few places only, the trees failed from the insufficiency of the drain. But by opening the drain and raising the ground, by half a buckload of loam, I found on setting out a new tree, it flourished equally with the rest. This orchard, now in eight years, is a most valuable one, and most of the trees would give half a barrel of apples.

From this and other circumstances which have fallen within my observation, it appears that low land, if strong soil and well drained, will give a fine orchard, and probably sooner than any other.

The next effort was made under totally opposite circumstances. The object was, to have an orchard on a particular spot, where the soil was thin and light upon a plain or flat. The holes were dug four feet over. The two upper strata of black and yellow loam were placed aside the tree. After this, about ten inches in depth of the gravelly or poorer earth was taken out and carted off, and a horse-cart load of stones upset into the hole; upon these, a part of the upper stratum, or some dirt from the side of the road was scattered so as to fill up the interstices, since

which the spots near the trees have been cultivated, by planting four hills of potatoes round each tree. The result has been tolerably favourable with all. But the trees having the stones placed at the roots have exceedingly outstripped the others.*

From the result it is to be hoped, that in this easy mode, disadvantages may be counteracted, and the benefit of a deep soil had for the growth of an orchard near our dwellings, or wherever wished. As to the distance, I incline to less than is general. The best orchards I have seen have been from 25 to 30 feet distance. This is the more important, as the land if fed at all, should only be occasionally cropped a little by horses. Horned cattle, if freely admitted, will soon disappoint all expectation. It will be perceived in the difficulty of raising an orchard, an old and long improved soil is alluded to. In a new soil where the apple tree is introduced, in clearing off the forest, in this part of the country, as well as Upper Canada, they set out a tree which they often defend by upsetting a stump, so as to enclose it between roots, and they have fruit very soon indeed.

The profit of a fine orchard is familiar to our farmers.—The fact is well known in this neighbourhood, that 160 barrels of apples were gathered a few years since, from less

* The dimensions of the Trees in the first experiment—a rich low, black, stony, soil, drained, were at the expiration of eight years 15 to 17 inches circumference, one foot from the ground. This may be considered (the tree being small when set out) as a growth of about two inches a year. The growth in the second experiment for six years, was, 12 to 14 inches in the holes, in which the stones were put one foot from the ground. Where no stones were put, 9 inches was the growth. It will thus be perceived, that the vegetation was most powerful under circumstances by nature least favourable. If then, thus much can be done to counteract such disadvantages, it surely offers much encouragement to our efforts, and leads us to hope, that not only in this, but in other objects, they may be beneficially extended.

than two acres, in the town of Dorchester. This with the cyder made from the refuse apples, and grass, gave about \$300 per acre; an income rarely exceeded in the improvement of soil. I have been minute and particular, from a wish, that others better informed, may be induced to contribute the advantages of their experience. A fine orchard is not only a source of emolument to a farmer, but one of the most beautiful and gratifying objects that can adorn a country. I am yours,

JOHN WELLES.

Dorchester, Oct. 31st, 1819.

CATTLE SHOW, EXHIBITION OF MANUFACTURES, PLOUGHING MATCH, AND PUBLIC SALE OF ANIMALS AND MANUFACTURES, AT BRIGHTON---On TUESDAY and WEDNESDAY, the 17th and 18th of October, 1820.--To commence at Nine o'Clock, A. M. on each day.

THE Trustees of the Massachusetts Society for the promotion of Agriculture, encouraged by the patronage of the Legislature of this State, intend to offer in Premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds. They, therefore, announce to the public, their wish to have a Cattle Show, and Exhibition of Manufactures, &c. &c., at Brighton, on Tuesday and Wednesday, the 17th and 18th of October, 1820; and they offer the following Premiums:—

FOR STOCK.

For the best Bull, raised in Massachusetts, above one	
year old,	\$40
For the next best do. do.	25

For the best Bull Calf, from 5 to 12 months old, -	\$15
For the next best do. do. - - - - -	8
For the best Cow, not less than 3 years old, - -	40
For the next best do. do. - - - - -	30
For the next best do. do. - - - - -	20
For the best Heifer, from 1 to 3 years old, with or without Calf, - - - - -	15
For the next best do. do. - - - - -	10
For the best Ox, fitted for slaughter ; regard to be had to the mode and expense of fattening, - - -	50
For the next best do. do. - - - - -	40
For the next best do. do. - - - - -	30
For the best pair of Working Cattle, - - - -	30
For the next best do. do. - - - - -	25
For the next best pair do. do. - - - - -	20
For the next best do. do. - - - - -	15
For the next best do. do. - - - - -	10
For the best pair of Spayed Heifers, not less than one year old, - - - - -	25
For the best Spayed Sows, not less than four in num- ber, and not less than 5 months old, - - -	20
The claimant to be entitled to either of these two last premiums, must state the mode of operation and treatment, in a manner satisfactory to the Trustees.	
For the best Merino Wethers, not less than six in number, having respect to form and fleece, -	20
For the next best do. do. do. - - - - -	10
For the best native Wethers, not less than six in num- ber, do. - - - - -	10
For the best do. do. do. - - - - -	5
For the best Merino Ram, do. - - - - -	20
For the next best do. - - - - -	10
For the best Merino Ewes, not less than five in num- ber, do. - - - - -	30
For the next best do. do. do. - - - - -	15

For the best Boar, not exceeding two years old, do.	\$10
For the next best do. do. do.	5
For the best Sow, not more than four, and not less than one year old, - - - - -	10
For the next best do. do. do.	5
For the best Pigs, not less than two in number, nor less than four months old, nor more than eight, -	10
For the next best do. do.	5

None of the above animals will be entitled to premiums, unless they are wholly bred in the State of Massachusetts.

No animal, for which to any owner one premium shall have been awarded, shall be considered a subject for any future premium of the Society, except it be for qualities different from those for which the former premium was awarded.

Any of the above Stock, when raised, and still owned at the time of exhibition, by the person who raised them, will entitle the claimant to an allowance of ten per cent. in addition. But Sheep, to be entitled to any of the above premiums, must be raised by the person entering them.

FOR AGRICULTURAL EXPERIMENTS.

To the person who shall raise the greatest quantity of Wheat on an acre, - - - - -	\$30
To the person who shall raise the greatest quantity of Indian Corn on an acre, not less than 70 bushels, -	30
To the person who shall make the most satisfactory experiment, to ascertain the best mode of raising In- dian Corn, in hills, in rows, or in ridges; not less than half an acre being employed in each mode, in the same field, the quantity and quality both of land and manure to be equal and uniform in each mode; all to receive a cultivation requisite to produce a good crop, - - - - -	30

- To the person who shall raise the greatest quantity of
Carrots on an acre, not less than 600 bushels, - \$20
- To the person who shall raise the greatest quantity of
Potatoes on an acre, not less than 500 bushels, - 20
- To the person who shall raise the greatest quantity of
Parsnips, on an acre, not less than 400 bushels, - 20
- To the person who shall raise the greatest quantity of
common Beets, on an acre, not less than 600 bushels, 20
- To the person who shall raise the greatest quantity of
Mangel Wurtzel, on an acre, not less than 600 bushels, 20
- To the person who shall raise the greatest quantity of
Ruta Baga, on an acre, not less than 600 bushels, 20
- To the person who shall raise the greatest quantity of
common Turnips, on an acre, not less than 600
bushels, - - - - - 20
- To the person who shall raise the greatest quantity of
Onions, on an acre, not less than 600 bushels, - 20
- To the person who shall raise the greatest quantity of
Cabbages, on an acre, not less than 25 tons weight, 20
- To the person who shall introduce any Grass, not be-
fore cultivated in this State, and prove, by actual ex-
periment, and produce satisfactory evidence of its
superiority to any now cultivated, - - - 30
- To the person who shall give satisfactory evidence on
"Soiling Cattle," not less than six in number, and
through the whole season, together with a particular
account of the food given, and how cultivated, - 30
- To the person who shall make the experiment of turn-
ing in green crops as a Manure, on a tract not less
than one acre, and prove its utility and cheapness
over any other manure, giving a particular account
of the process, and its result, - - - 30
- To the person who shall, by actual experiment, prove
the best season and modes of laying down lands to
grass, whether spring, summer, or fall seeding be
preferable, and with or without grain on different soils, 30

To entitle himself to either of the Premiums, under this head of Agricultural Experiments, the person claiming, must cultivate a tract of at least one acre in one piece, with the plant or production for which he claims a premium; and must state, in writing, under oath of the owner, and of one other person, (accompanied by a certificate of the measurement of the land, by some sworn surveyor,) the following particulars :

1. The state and quality of the land, in the spring of 1820.
2. The product and general state of cultivation and quantity of manure, employed on it the year preceding.
3. The quantity of manure used the present year.
4. The Quantity of seed used, and of Potatoes the Sort.
5. The times and manner of sowing, weeding, and harvesting the crop, and the amount of the product ascertained, by actual measurement, of the whole produce, for which a premium is claimed, and the entire expense of cultivation.

And in relation to all vegetables, except Potatoes, Onions and common Turnips, the fair average weight of at least twenty bushels must be attested; and if hay scales be in the town, in which raised, not less than three averaged cart loads must be weighed.

The claim under this head, together with evidences of the actual product, must be delivered, free of postage, to Benjamin Guild, Esq. Assistant Recording Secretary of this Society, on or before the first day of December next. The Trustees not intending to decide upon claims under the head of Agricultural Experiments, until their meeting in December.

FOR INVENTIONS.

To the person who shall invent the best, simplest, and least expensive Machine for Threshing Wheat, or any small Grains, mown as well as reaped, - \$75

To the person who shall use the Drill Plough, or Machine, and apply it most successively to the cultivation of any small Grains or Seeds, on a scale not less than one acre, - - - - - \$20

To the person who shall invent the best Machine, for pulverising and grinding plaster to the fineness of twenty-five bushel per ton, and which shall require no more power than a pair of Oxen or a Horse, to turn out two tons per day, and so portable that it can be removed from one farm to another without inconvenience, - - - - - 30

To the person who shall produce, at the show, any other Agricultural Implement of his own invention, which shall, in the opinion of the Trustees, deserve a reward, - - - - - 20

In all cases, proof must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer.

FOR FOREST TREES.

For the best Plantation of White Oak Trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state on the first of September, 1823, - - - - - 100

For the best Plantations of White Ash, and of Larch Trees, each of not less than one acre, nor fewer than one thousand trees per acre, to be raised from the seeds, and which trees shall be in the best thriving state on the first of September, 1823, - 50

For the best Live Hedge, made of either the White or Cockspur Thorn, planted in 1820, not less than one hundred rods, and which shall be in the best state in 1823, - - - - - 50

FOR DOMESTIC MANUFACTURES.

To the person or corporation who shall produce the best specimen of fine Broadcloth, not less than 1 5-8ths yards wide, exclusive of the list, 40 yards in quantity, and dyed in the wool,	-	-	-	\$30
For the second best do. do. do.	-	-	-	20
For the best superfine Cassimere, not less than 3-4 yards wide, nor less than 40 yards in quantity,	-			15
For the second best do. do. do.	-	-	-	10
For the best superfine Satinet, 3-4 yards wide, not less than 50 yards,	-	-	-	10
For the second best do. do. do.	-	-	-	6
To the person or corporation, who shall produce the best specimen of Cotton Cloth, manufactured in this State, not less than 50 pieces,	-	-		20
To the person who shall produce the best specimen of any other fabrics of Cotton, manufactured in this State, in public factories, not less than 50 pieces,				20
In private families, not less than 5 pieces,	-	-		20

FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 wide, not less than 20 yards in quantity,	-	-	-	12
For the second best do. do.	-	-	-	8
For the best double milled Kersey, 3-4 yard wide, not less than 20 yards in quantity,	-	-		12
For the second best do. do.	-	-	-	8
For the best Coating, 3-4 yard wide, and not less than 20 yards in quantity,	-	-	-	8
For the second best do. do.	-	-	-	6
For the best Flannel, 7-8 yard wide, not less than 45 yards in quantity,	-	-	-	10
For the second best do. do.	-	-	-	7

For the best do. 4-4 yard wide Carpeting, not less than 30 yards in quantity,	- - - - -	\$15
For the second best do. do.	- - - - -	7
For the best 5-8 yard wide Stair Carpeting, not less than 30 yards in quantity,	- - - - -	10
For the second best do. do.	- - - - -	7
For the best pair of Blankets, not less than 8-4 wide and 10-4 long,	- - - - -	6
For the second best do. do.	- - - - -	4
For the best Woollen Knit Hose, not less than 12 pair in number,	- - - - -	5
For the second best do. do.	- - - - -	3
For the best Worsted Hose, not less than 12 pair in number,	- - - - -	5
For the second best do. do.	- - - - -	3
For the best Men's Half Hose, (woollen) not less than 12 pair in number,	- - - - -	4
For the second best do. do.	- - - - -	2
For the best Men's Woollen Gloves, not less than 12 pair in number,	- - - - -	5
For the second best do. do.	- - - - -	3
For the best Linen Diaper, 5-8 yard wide, and not less than 30 yards in quantity,	- - - - -	5
For the second best do. do.	- - - - -	3
For the best 4-4 yard Diaper, (for table linen) not less than 30 yards in quantity,	- - - - -	10
For the second best do. do.	- - - - -	5
For the best specimen of Sewing Silk, raised and spun in this State, of good fast colors, not less than one pound,	- - - - -	5
For the second best do. do.	- - - - -	3
For the best Linen Cloth, (for shirting or sheeting) one yard wide, and 25 yards long,	- - - - -	8
For the second best do. do.	- - - - -	4

For the best Butter, not less than two tubs, nor less than 50 pounds.	\$10
For the second best do. do.	5
For the best Cheese, not less in quantity than 100 lbs.	10
For the second best do. do.	5
For the best Sole Leather, not less than five sides,	10
For the second best do. do.	5
For the best dressed Calf Skins, not less than twelve in number,	10
For the second best do. do.	5
For the best ten Reams of Quarto Post Letter Paper,	10
For the best ten Reams of Foolscap Writing Paper,	10
For the best five Barrels of superfine Flour, manufactured in the State of Massachusetts, from Wheat, raised in this State,	25

All the above manufactures, except when of Cotton, must be of the growth and manufacture of the State of Massachusetts. And all Manufactures, when presented, must have a private mark, and any public or known mark must be completely concealed, so as not to be seen, or known by the Committee, nor must the Proprietors be present when they are examined; in default of either of which requisitions, the articles will not be deemed entitled to consideration or premium.

Animals, Manufactures, or Articles, may be offered for Premium at Brighton, notwithstanding they may have received a Premium from a County Agricultural Society.

It is understood, that whenever, merely from a want of competition, any of the claimants might be considered entitled to the Premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is not deserving of any reward, the Judges shall have a right to reject such claims. Persons to whom Premiums shall be awarded, may, at their option, have an article of Plate, with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

The Trustees of the Massachusetts Society for promoting Agriculture, hereby give notice, that they intend, on the second day of the Cattle Show, viz. : on the eighteenth day of October next, to give Premiums to the Owners and Ploughmen of the three Ploughs, which shall be adjudged, by a competent Committee, to have performed the *best work, with least expense of labour*, not exceeding half an acre to each Plough, and of such depth as the Committee shall direct. The team used, to be always such as is ordinarily used on his farm, for breaking up land, by the competitor, and to be an ox team.

First Plough, . . .	\$20	Second Plough, . . .	\$12
Ploughman, . . .	10	Ploughman, . . .	6
Driver, . . .	5	Driver, . . .	3
Third Plough, . . .	\$8		
Ploughman, . . .	4		
Driver, . . .	2		

In each case, if there be no Driver, both sums to be awarded to the Ploughman.

The persons engaging in the Ploughing Match, must own their respective Ploughs and Cattle ; and the Ploughman, (if he be not the owner,) must be a man employed on the owner's farm.

The persons intending to contend for these Prizes, must give notice, in writing, to S. W. POMEROY, or GORHAM PARSONS, Esquires, of *Brighton*, on or before the tenth day of October, so that proper arrangements may be made for the purpose. No person will, on any consideration, be admitted without such notice. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committee, on the subject. The Ploughs to be ready to start at 9 o'clock, A. M.

The result of the last Ploughing Matches at Brighton, and the satisfaction expressed by so many of their agricultural brethren, will induce the Society to continue these

Premiums annually, in connexion with the Cattle Show ; as an efficacious means for exciting emulation and improvement in the use and construction of the *most important instrument* of Agriculture.

Persons intending to offer any species of Stock, or any Article, whatever, for Premium, are requested to give notice thereof, either by letter, (post paid) stating the Article, or to make personal application to Mr. JONATHAN WINSHIP, at *Brighton*, on or before the sixteenth day of October, and requesting him to enter such notice or application ; so that tickets may be ready at 9 o'clock of the seventeenth. No person will be considered as a competitor, who shall not have given such notice, or made such application for entry, on or before the time above specified.

The applicants will be held to a rigid compliance with this rule relative to entries, as well as to the other rules prescribed.

The examination of every species of Stock, (except Working Oxen,) and of Domestic and Household Manufactures, will take place on the seventeenth ; and the trial of Working Oxen, examination of Inventions, and Ploughing Match, on the eighteenth of October.

The Trustees also propose to appropriate, on the second day of the Cattle Show, their Pens, for the public sale of any Animals, that have been offered for Premiums, and also of any others, that are considered by them, as possessing fine qualities ; and their Halls for the public sale of Manufactures. Both sales to take place at half-past eleven o'clock, precisely. And for all Animals or Manufactures, that are intended to be sold, notice must be given to the Secretary, before ten o'clock of the eighteenth. Auctioneers will be provided by the Trustees.

By order of the Trustees.

JOSIAH QUINCY,

Chairman of the Committee of Premiums.

January, 1820.

OFFICERS OF THE SOCIETY FOR 1820.

AARON DEXTER, M.D. *President.*
 SAMUEL W. POMEROY, Esq. *1st Vice-President.*
 THOMAS L. WINTHROP, Esq. *2d Vice-President.*
 JOHN PRINCE, Esq. *Treasurer.*
 JOHN LOWELL, Esq. *Corresponding Secretary.*
 HON. RICHARD SULLIVAN, *Recording Secretary.*
 BENJAMIN GUILD, Esq. *Assistant Recording Secretary.*

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Hon. P. C. Brooks,	S. G. Perkins, Esq.
Hon. John Welles,	Gorham Parsons, Esq.
Hon. Josiah Quincy,	E. Hersey Derby, Esq.

LIST OF MEMBERS, ADMITTED SINCE JULY, 1818.

Aspinwall, Augustus, Mr.	<i>Boston.</i>
Appleton, Samuel, Esq.	<i>Do.</i>
Allen, Samuel C., Esq.	<i>Northfield.</i>
Amory, Nathaniel, Esq.	<i>Boston.</i>
Alden, Cyrus, Esq.	<i>Do.</i>
Adams, Nathan, Mr.	<i>Medford.</i>
Bigelow, Timothy, Hon.	<i>Do.</i>
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Bemis, Nathaniel, Mr.	<i>Watertown.</i>
Bemis, Luke, Esq.	<i>Do.</i>
Bemis, Seth, Esq.	<i>Do.</i>
Beal, John, Mr.	<i>Hingham.</i>
Bainbridge, William, Esq.	<i>Boston.</i>
Benjamin, Asher, Mr.	<i>Dorchester.</i>
Bartlett, John, Dr.	<i>Roxbury.</i>

Bird, George, Mr.	<i>Walpole.</i>
Bradlee, Joseph P., Mr.	<i>Boston.</i>
Baldwin, Benjamin F., Esq.	<i>Woburn.</i>
Buckminster, Lawson, Mr.	<i>Framingham.</i>
Bentley, William, Rev.	<i>Salem.</i>
Champney, John, Esq.	<i>Roxbury.</i>
Cranston, Joel, Mr.	<i>Marlborough.</i>
Cook, John, Mr.	<i>Cambridgeport</i>
Clark, Simpson, Mr.	<i>Boston.</i>
Cushing, Edmond, Esq.	<i>Lunenburg.</i>
Clap, Isaac, Mr.	<i>Dorchester.</i>
Cochran, William, Mr.	<i>Boston.</i>
Crehore, Thomas, Mr.	<i>Dorchester.</i>
Clap, Mather T., Mr.	<i>Boston.</i>
Clap, Pliny, Mr.	<i>Do.</i>
Chapman, Effingham L., Mr.	<i>Uxbridge.</i>
Crowningshield, Benjamin, Hon.	<i>Salem.</i>
Coolidge, Joseph Jr., Esq.	<i>Boston.</i>
Dwight, Henry W., Esq.	<i>Stockbridge.</i>
Downie, Samuel, Mr.	<i>Roxbury.</i>
Dorr, John, Esq.	<i>Boston.</i>
Duncan, Samuel, Mr.	<i>Haverhill.</i>
Davis, Samuel, Mr.	<i>Boston.</i>
Fayerweather, John, Esq.	<i>Westborough.</i>
Fuller, Benjamin, Esq.	<i>Dorchester.</i>
Gay, Luther, Mr.	<i>Cambridgeport.</i>
Gardner, Henry D., Mr.	<i>Dorchester.</i>
Gibbs, Alexander H., Mr.	<i>Roxbury.</i>
Gay, Willard, Esq.	<i>Dedham.</i>
Greene, Charles W., Esq.	<i>Roxbury.</i>
Gates, Silas, Mr.	<i>Marlborough.</i>
Gay, Jotham, Esq.	<i>Dedham.</i>
Heywood, Abiel, Esq.	<i>Concord.</i>
Hill, Aaron, Esq.	<i>Boston.</i>
Hale, Nathan, Esq.	<i>Do.</i>

Haskins, Ralph, Esq.	<i>Boston.</i>
Howard, Edward, Mr.	<i>Oxford.</i>
Hammat, Wm., Major,	<i>Scituate.</i>
Howard, Jonathan, Mr.	<i>Boston.</i>
Hale, David, Jr. Mr.	<i>Do.</i>
Hallet, George, Esq.	<i>Do.</i>
Hatch, Nymphas, Esq.	<i>Westford.</i>
Jones, Samuel, Mr.	<i>Northampton.</i>
Jones, Oliver, Mr.	<i>Dracut.</i>
Jackson, Wm., Esq.	<i>Plymouth.</i>
Jackson, Patrick T., Esq.	<i>Boston.</i>
Jarvis, Deming, Mr.	<i>Do.</i>
Lincoln, Martin, Esq.	<i>Hingham.</i>
Lloyd, James, Hon.	<i>Boston.</i>
Loring, Eliphalet, Mr.	<i>Hingham.</i>
Lumbard, Daniel, Mr.	<i>W. Springfield.</i>
Lovell, James, Dr.	<i>Weymouth.</i>
Lawrence, Abbot, Mr.	<i>Boston.</i>
Lee, Thomas, Esq.	<i>Cambridge.</i>
Lemist, John, Mr.	<i>Roxbury.</i>
M'Lellan, Isaac, Esq.	<i>Boston.</i>
Munroe, Edmund, Mr.	<i>Do.</i>
Murdoch, George, Mr.	<i>Do.</i>
Munson, Israel, Esq.	<i>Do.</i>
Pickman, Benjamin, Jr. Esq.	<i>Salem.</i>
Perry, John, Mr.	<i>Boston.</i>
Pomeroy, Asahel, Esq.	<i>Northampton.</i>
Putnam, Jesse, Esq.	<i>Boston.</i>
Parker, Luther, Mr.	<i>Do.</i>
Parker, Leonard M., Hon.	<i>Charlestown.</i>
Putnam, Daniel, Esq.	<i>Lewenburg.</i>
Parker, Nathan, Deacon	<i>Boston.</i>
Richardson, John, Esq.	<i>Newton.</i>
Robbins, Peter, G., Esq.	<i>Roxbury.</i>
Rice, Benjamin, Esq.	<i>Marlborough.</i>

Russell, Nathaniel P., Esq.	<i>Boston.</i>
Shepherd, James, Mr.	<i>Northampton.</i>
Stackpole, William, Esq.	<i>Boston.</i>
Stearns, Asahel, Esq.	<i>Cambridge.</i>
Skinner, Jno., Esq.	<i>Charlestown.</i>
Shed, George, Mr.	<i>Boston.</i>
Stearns, Thomas, Esq.	<i>Lunenburg.</i>
Salisbury, Samuel Jr., Esq.	<i>Boston.</i>
Story, Joseph, Hon.	<i>Salem.</i>
Silsbee, Nathaniel, Hon.	<i>Do.</i>
Stearns, Luther, Mr.	<i>Medford.</i>
Stevens, Isaac, Mr.	<i>Boston.</i>
Swift, Benjamin, Mr.	<i>Charlestown.</i>
Tappan, Jno., Esq.	<i>Boston.</i>
Touro, Abraham, Esq.	<i>Medford.</i>
Thaxter, Levi, Esq.	<i>Watertown.</i>
Tarbell, Grosvenor, Dr.	<i>Lincoln.</i>
Tilden, Bryant P., Esq.	<i>Boston.</i>
Tileston, Wm., Mr.	<i>Do.</i>
Tenney, David, Major	<i>Sutton.</i>
Tucker, Nath., Esq.	<i>Newton.</i>
Tyler, John Stale, Mr.	<i>Boston.</i>
Tufts, Joseph, Esq.	<i>Charlestown.</i>
Tuckerman, Henry H., Esq.	<i>Boston.</i>
Valentine, John T., Esq.	<i>Do.</i>
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REMARKS ON SOILING.

[Communicated by the Hon. Josiah Quincy.]

THE practice of "soiling cattle," as it is called, or keeping them, all the year round, in their stables, with only a daily and short liberty of a yard, having been a frequent subject of the attention, and an object of a proffered premium, by the board of Trustees of the Massachusetts Society for promoting Agriculture, I shall, in conformity with their request, communicate my own practice and experience, on that mode of managing stock.

Previously, however, to stating any observations, upon the results of my own experience, I think it may be useful to abstract and digest into a regular form, some of the principal facts and reasonings of transatlantic farmers. These may tend to attract the attention of our practical husbandmen more forcibly to the subject, and enable those, whose farms and capital are in a condition that authorizes the adopting of this mode, to do it with more facility and success.

There are six distinct advantages, which those, who advocate soiling, propose to themselves by the practice, and on which they establish the preference of this mode to the common one of pasturing cattle during the summer.

1st. The saving of land.

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2d. The saving of fencing.

3d. The economizing of food.

4th. The better condition and greater comfort of the cattle.

5th. The greater product of milk.

6th. The attainment of manure.

The only offset to all these advantages is the labour of raising and cutting the food, and feeding and taking care of the stock.

1st. *The saving of land.* In relation to this fact, there can be no question. All European writers assert it. They differ only as to the degree of saving which results. Some assert that it is as *one* to *three*. Others, as *one* to *seven*. Others assert the saving to be yet greater. That is, *one acre kept for soiling will go as far as three or seven kept for pasture, in the support of stock.* It is not important to analyze this point farther. For every practical purpose, the evidence is sufficient, to satisfy every mind, that a very great saving of land results from this practice, and that on farms, *where the whole soil is capable of being ploughed*, the economy of soiling is great; and on all such farms may profitably be adopted, provided that the expenses, incident to the mode, do not counterbalance these advantages.

It may be, however, useful to observe that the reason of the diversity of statement, in relation to the degree of saving, among European writers, results from the different ways, in which the land, used for soiling, is cultivated for the purpose of raising food. Some satisfy themselves with enriching the former pasture and cutting the grass it produces, for the soiling use. Others plough up the pasture, raise cabbages or other succulent food, on which they support their stock. Now it is plain the result of a comparison of saving of land made between an acre of enriched pasture, and an acre, appropriated to the latter of these modes of husbandry, must be very different.

In either case, the economy is sufficiently great, and, if nothing else be an offset for the advantage, this must be decisive.

2d. *Saving of fencing.* Here also is a great and decided economy. It includes not only the saving of the material used for fencing; the labour of making the fence; and of keeping it in repair; but also of the land occupied by the fences; and of all the headlands, which are necessarily left on each side the fence; and which are usually an apology for slovenliness and a refuge for vermin. I have seen no precise estimate of this economy. Nor does it seem to be practicable, to be made, upon any principle, applicable to farms in general. It will be obviously greater, or less, according to the previous condition of the fences, and the ordinary necessity of erecting such as are usually deemed requisite on each particular farm. Here also the greatness of the economy is, everywhere, so obvious as to render any particular calculations unimportant. The general effect of soiling cattle is, *to render all interior fences absolutely useless*; excepting those, which surround the buildings, and lead from these to the highway. A farm thus relieved from interior fences, not only enjoys all the exemptions from great actual and great annual expenditures, but also there are other facilities, in its management, resulting from this absence of interior fences, which are obvious and considerable. There is no waste land. The whole may be divided into cultivation, with precise reference to the state of soil. When the plough runs, the length of the furrow is determined only by the judgment of the proprietor. It presents to the eye a scene of cultivation; neat, orderly and beautiful.

3d. *The economy of food.* There are six ways by which beasts destroy the article destined for their food. 1. By eating. 2. By walking. 3. By dunging. 4. By staling. 5. By lying down. 6. By breathing on it. Of these six, the first only is useful. All the others are wasteful.

By pasturing, the five last modes are exercised without any check, or compensation. By keeping in the house, they may be all prevented totally by great care; and almost totally, by very general and common attention.

It is on the saving, resulting from this prevention of waste that much of the economy of this mode of keeping beasts depends. In pastures, whatever is trod upon, or is affected by their dung, or their urine, is lain upon, or even long breathed upon, is lost. And this waste is always in proportion to the richness and the productive power of the pasture; for just in that proportion is the quantity of food injured by all the five modes of destruction above stated. Whereas the same being cut and delivered to them sparingly, in point of time, but sufficient in point of quantity, will every particle of it be consumed. Besides, it is found by experience, that, in this mode of feeding, beasts will eat many products of the earth, in the stall, which they will absolutely reject in the pasture.

4th. The better condition and greater comfort of the cattle.

The condition of cattle will always depend chiefly upon the quantity and the quality of the food and regularity of their supply. In all these respects, feeding in the stall has the advantage of pasturing, because in stall feeding, all are under the guidance of intelligence and discretion; and nothing is left to accident, whereas, in pasturing, the beasts are left to their own care. When the pastures are good, and there is a great surplus of food upon them, the difference is not, in this respect, great; but as soon as the pastures become "pinched" as it is called, by drowth, the difference is always perceptible. Farmers, who pasture their cattle, seldom, if ever, provide a supply of succulent food, to be in readiness in case of any accidental deficiency of pasture. The consequence is that, on the pasturing system, the summer condition of cattle always depends wholly on the state of the pastures. Now as every farmer, where he is able, does, and ought to stock his pastures up to their full pasture power, it follows, that even a small drought will affect the condition of the animal something; and a severe one, very sensibly; a fact, of which every

man may convince himself by observing cattle, at pasture, in dry seasons. Now one great benefit, resulting from stall feeding, is that it makes the condition of cattle, in as great a degree as possible independent of variations of the season ; and although an absolute independence is impossible, yet it is always much greater in stall feeding than it can be in any mode of pasturing.

The want of sufficient exercise, which is inseparable from this mode of feeding in stalls, is a popular, and when not tested by fact, is deemed an unanswerable objection. Yet all those who have made the experiment and whose opinions I have seen expressed upon the subject, are unanimous in declaring that no ill effect results from this circumstance. One writer asserts that he has kept a large herd for several years, in this way, and during the whole time, "he never had an animal essentially sick, had never one die, and had never one miscarry."

It is to be observed that stall feeding of cattle, does not imply keeping cattle in stalls, or in the house *the whole* time. It only intends, always feeding them there, and keeping them there the chief of the time. On the contrary, it is an essential part of the system, to let them loose in yards, well shaded either artificially, or by trees, at least two hours in the forenoon and as many in the afternoon. Here they lay themselves at their ease, in the best ruminating attitudes, or move round taking some exercise in that act, or in rubbing themselves against posts provided for the purpose. If any person will observe the slowness, with which cattle usually walk in their pastures, that while in feeding they do little more than stand ; and when full, that they almost invariably lie down, he will hardly believe that the difference between the exercise thus attained and that which they get by having four hours in the day exclusively devoted to that object, can scarcely materially affect their health. When to this is added the consideration, that when fed in the stall, they are wholly protected from eating any

noxious vegetables; from drinking bad water; from all injury, from being worried by dogs, or one another; that they are kept through the heat of the day, in the cool shades; under cover; protected from flies; it cannot be a question but that this mode is far more conducive to the health of the animal than pasturing possibly can be. Experience is also decisive upon the subject. If the condition of the animal be, as is here shown, better, it follows that this state must be more comfortable; for the one is dependant on the other.

5th. Greater product of milk. Although it is generally stated that this is the case, yet I do not recollect having met with any precise comparison upon the subject. The general apprehension among farmers, seems to be, that although the condition of the animal may be better, yet that the tendency of the food to milk is not so great as when they are permitted to range in pastures. The truth, however, upon this point can easily be explained, and in a manner perfectly conformable to my own experience. During the flush of feed, that is, for perhaps the first month after cattle are turned to pasture, there is little difference, so far as respects the milk product, between pasturing and stall feeding. At that time there is generally a great supply of food, the cattle are eager after it. They have great opportunity to select. They feed quietly, and take only the most nutritious and palatable. After this month, if the stall feeder will, this equality will gradually cease; and in his favour. The pasture food almost always grows more or less scarce, according to the particular character of the season. Whereas by taking care to provide a regular succession of succulent crops, he who feeds his beasts in stalls may keep the milk product unaffected by the state of the season, to the end of the autumn.

6th. The attainment of manures. This is a great and characteristic benefit, resulting from soiling; or stall feeding of cattle through the year. In pasturing, the sum-

mer manure is almost wholly lost. It falls upon rocks, among bushes, in watercourses, on the sides of hills. It is evaporated by the sun. It is washed away by the rain. Insects destroy a part. The residuum, a dry hard cake, lies sometimes a year upon the ground; often impeding vegetation, and never enriching the earth, in any thing like the proportion it would do, if it had been deposited under cover and kept free from the action of the sun, in appropriate and covered receptacles, to be carted out annually in the proper season, and ploughed at once under the surface.

The gain by this saving of the summer manure of beasts, although stated by European writers, yet it is generally loosely done, and often in measures of quantity, or capacity, not easily reducible to those, which prevail in our country. It is, however, unequivocally very great and important, and well worthy the solicitude of every farmer. As the great object of every farmer ought to be, to increase his quantity of manures, there can be no mode preferable to the one here suggested. For suitable receptacles, or recipients being provided, every thing of the nature of excrementitious matter is preserved and deposited in the soil, at the leisure and at the discretion of the farmer.

It was the conviction, resulting from the preceding facts and statements, which led me to adopt, two or three years since, the idea of putting my farm into this mode of management. The particular situation of it, seemed to point it out as precisely suited to such a mode of conduct. It is a level plain, constituted of alluvion upon clay, occasionally intermixed with lighter quality of soil. It had no fences but post and rails, so that by adopting this mode, it might be wholly relieved from interior fences, the expense of which had always been a heavy item in my farm accounts. For the three years past, I have been, in this practice. During the two former years with some occasional deviations. During the last, regularly, and systematically, without any deviation. The result has been all that I anticipated, in

every respect. Indeed it has been so satisfactory, that I think no considerations would induce me to adopt a different mode in the management of my stock.

The result of my experience has been perfectly conformable to the statements made by European writers.

My stock has been uniformly healthy ; in a condition generally superior to my neighbours' ; all of whom pastured their cattle. In point of milk, during the flush of feed in June, the product was not inferior to any, according to the number of my cows, with which I had an opportunity to compare. In July and August, in my vicinity the drowth was severe, and the milch cows in my neighbourhood fell off in their milk, nearly, and some, quite, a half. Mine were kept during the whole season, without any sensible diminution, which could be attributed to the want of food, or its quality. The cows throve and showed no marks of discontent. None were materially sick. I lost none.

With respect to stock, the practice upon my farm had been from almost time immemorial to keep from ten to fifteen head of cattle. For the support of these, *about fifty acres of land* were appropriated during the summer months. Besides which they were permitted to range in the autumn over the mowing. The result was, that in good seasons, the stock throve and were kept well. When the seasons were dry, they fared badly. When the drowth was severe, they were shut up and fed upon corn stalks or hay. This was the usual course. And the practice and the result is at this day very similar, in all my vicinity.

My practice, and the result of the past year were the following :

My stock, consisting at an average of twenty cows, were kept in their stalls through the whole year. The practice was to feed them about six times in the day, and to permit them to range in a yard about eighty feet square, two hours in the forenoon and two in the afternoon. They were kept

well littered and well curried, while they were out of the stable, the attendant took that opportunity to clean the stalls, and to supply fresh litter. During winter, they were fed, as is usual, with salt and fresh hay and vegetables.— From June to November, inclusive, may be considered, strictly speaking, the soiling season ; by which is understood, that, in which they are fed with green food in the house. As this is the critical period, I shall be minute in the account of my preparations and proceedings.

In the autumn preceding I had caused rye to be sown upon an inverted sward, very thick, on about three acres. Early in April I prepared and sowed, in manner as shall be stated afterwards, about three acres and one quarter of land with Indian corn in drills. I also sowed about three acres of oats and buckwheat, broadcast, at the rate of three bushels to the acre, about the latter end of the month. The whole quantity of land I thus prepared to be used in soiling, in aid of my grass, did but little exceed nine acres. Of these, that which I sowed with rye, turned out so poorly, that I never soiled from it more than five days, so that in fact the land thus prepared did, in efficiency, but little exceed six acres.

About the first of June, cattle in general were this season turned out to pasture. On the 30th of May, my farmer began to cut the sides of the road leading to my house from the highway and orchard. He continued to soil from this and from grass growing in my orchard until the seventh. On this day he abandoned cutting the grass for soiling, and began to cut from the winter rye. This was found too tough, and it was quitted and my farmer returned to soiling upon grass. Having cut over all the refuse of my grass, by the 24th of June, he then went into the poorest of my mowing land, and afterwards into my clover. From this he continued to soil, until the 6th of July. By this time, he had gone over not much short of three acres of mowing land. On the 6th of July, he began to soil

from my oats. He continued to soil from these until the 21st of July. On the 21st of July, he began to soil on Indian corn, on which he continued until the 26th, when he began to cut about two acres of late and light barley. On this he continued until the 30th of July, when he recommenced soiling on corn fodder, and continued upon it until the 31st day of August. On this day began to cut over the road sides, which had been first cut early in June. This was continued only to the 2nd of September, when he began to cut the second crop of Indian corn, growing upon the three and one fourth acres of Indian corn, which had now shot up in great luxuriance, from the roots of that, which had been cut over between the 21st and 26th of July. On this soiling, continued until the 8th of September.

On the 9th and 10th, he soiled upon about a fourth of an acre of millet and buckwheat. On the 11th, soiled on a second crop of clover. From the 12th to the 15th, inclusive, on corn stalks of about an acre of sweet corn, and on the 16th on a patch of millet and oats. This was continued to the 20th, when he began on two acres of Indian corn sown in drills, on the first of August, on land from which a crop of peas had been previously taken. Soiling was continued on this corn, until the 3d of October. From this time until the 15th of October, the soiling was wholly from second crop grass taken from various parts of my mowing land.

From the 15th of October, to about the 20th of November, they were kept wholly upon carrot and turnip tops arising from the topping of about twelve acres of both; being allowed always one foddering of salt hay. This finished the summer feeding. From this time they are kept wholly upon salt and English hay. The result then of this experiment, so far as relates to land, is the following:

The twenty head consumed the product of

2½ acres, roadsides and orchard.

3 do. mowing land.

3½ do. Indian corn, cut as fodder.

3½ Carried over.

3½ Brought over.

2 do. late and light barley.

3 do. oats.

2 do. late sown Indian corn after a pea crop.

¼ do. Buckwheat.

1 do. millet, buckwheat and oats.

17 Acres.

This is the whole land which was cut over for soiling ; with the exception of the after feed on the mowing land and the tops of carrots and turnips. In comparing this result with the former practice of my farm, I apprehend the following statement to be just.

I offset the keeping from the 11th of September to the 20th of November; against the old manner of letting the cattle run at large during the autumn months, on the mowing land, to its great injury, by poaching and close feeding.— If this should not be deemed sufficient, I then make no estimate of the difference between keeping fifteen head of cattle, the old stock, and twenty head of cattle, my present stock. After these allowances and offsetts, which no man can doubt are sufficiently liberal, then I state, that my experiment has resulted in relation to land, in this, that I have kept the *same amount of stock, by soiling on seventeen acres of land, which had always previously required fifty acres.* The result is, in my opinion, even in this respect greater than what is here stated. This, however, is sufficient to exhibit the greatness of the economy of this mode, so far as relates to land.

With respect to saving of fencing, the previous condition of my farm was this. I had at the lowest estimate five miles of interior fence, equal to sixteen hundred rods, which at one dollar the rod was equal, in original cost, to sixteen hundred dollars. And annually, for repairs and refitting, cost sixty dollars. *I have now not one rod of interior fence.* Of course this saving is great, distinct, and undeniable.

In relation to manures, the effect of soiling is not less apparent and unquestionable. The exact amount of summer product I have not attempted to ascertain, but I am satisfied that, every thing considered, it is not less than one buck load per month per head, or on twenty head of cattle, one hundred and twenty load for the six soiling months. In this estimate, I take into consideration the advantage resulting from the urine saved, by means of loam, sand, or some imbibing recipient, prepared to absorb it.

It remains to show that the cost of raising the food, cutting it, and distributing it to the cattle, is compensated by these savings. Upon this point, my own experience has satisfied me that the value of the manure alone, is an ample compensation for all this expence. Leaving the saving of land, of food, and of fencing stuff, as well as the better condition of the cattle, as a clear gain from the system.—As an evidence of this, I state my expences for labour in conducting the soiling process.

During the month of June, I hired a man to do every thing appertaining to the soiling process, that is, cutting the food, delivering it, taking care of the cattle in the day time, for fifteen dollars the month, he finding himself. In this arrangement, it was estimated, that I availed myself of half his labour. At the end of the month, I had the manure measured, and I found that the manure collected in my receptacle, which was a cellar, under the barn, and not including that which had been made during the four hours each day, in the yard, amounted to fifteen load. A quantity of manure, which I could not have placed on my farm, for thirty dollars ; and which I could have sold there, for twenty dollars, upon the condition it should be carried away. It cost me as above stated, fifteen dollars, in the labour of the attendant.

During the remaining five months, I added another man, because I found that a great economy in vegetable food, would result from cutting it into pieces by a cutting knife, and mixing with it about one third of cut salt hay, or straw.

This was done, and I kept an accurate account of all the labour of cutting the food, in the field, bringing it into the barn, cutting it up there, cutting salt hay or straw, to mix with it, mixing this food, and delivering it to the cattle, and found that it amounted to one hundred and forty-eight days' labour. This estimated at a dollar the day, is one hundred and forty eight dollars, to which adding fifteen dollars paid for labour, in the month of June, the whole expense was one hundred and sixty three dollars.

The manure at the end of the soiling season, certainly equalled one hundred and twenty loads, and could not have been bought, and brought there, for three hundred dollars. Let it be estimated at only two hundred dollars in value. No man can question, I think, the correctness of my assertion, that the value of the manure obtained, is a clear compensation for this amount of labour ; and this including all the expense of labour, connected with soiling.

It remains to be shown, in *what* manner the whole process ought to be conducted, by any one, who may originally attempt it, and also *how far* it is applicable to the farming condition of New England, and what species of farmers would find their account in attempting it.

(To be continued in our next.)

OF SALT AS A MANURE.

[IN England, considerable attention has been attracted of late, to the use of salt as a manure. The following extracts from a work, recently published in London, entitled "A Letter to the Farmers and Graziers of Great-Britain on the advantages of using Salt, in the various branches of agriculture and in feeding all kinds of farming stock, by SAMUEL PARKES," will present to the farmers of Massachusetts, the leading facts and considerations connected with the topic of salt as a manure.]

“ In some parts of Great-Britain, particularly in the neighbourhood of the Salt Works, the value of Common Salt, as a manure, is well known and acknowledged ; and it has lately been given in evidence before the select committee of the House of Commons, by a gentleman of the highest credit, that the farmers in Cornwall are so convinced of the value of Salt as a manure, that whenever the waste Salt that has been employed in curing fish is on sale, there is a violent contention among the occupiers of the land who shall obtain the largest share. The same gentleman informed the committee, that where wheat or barley has followed turnips, on land which had been salted, the ensuing crop has invariably escaped the mildew, although that disease had affected all the corn upon the lands immediately adjoining, on which Salt had not been used.

“ There is also a practice in Cornwall of manuring the lands with sea-sand for the sake of the Salt that it contains ; and so very efficacious is this found to be, that a writer, ninety years ago, computed the money laid out in that and the adjoining county for sea-sand to amount to thirty-two thousand pounds per annum ; and so much has this practice increased of late years, that Dr. Paris considers “ the expense of land carriage for sand used as a manure in *Cornwall alone* as now amounting at least to thirty thousand pounds annually.

“ The efficacy of Salt in destroying noxious weeds, grubs, worms, flies, and insects, is well known in many districts, and those who are incredulous may very easily satisfy themselves by direct experiment. For instance, if a few common earth worms be taken out of the ground, and sprinkled with a little Salt, they will be seen to writhe for a few minutes, and then expire. Thus Salt does, as it were, perform two operations at once, for, by destroying the worms and the weeds, while the land lies fallow, it prepares the ground most effectually for the reception of the corn or the plants, before it can possibly take any effect upon the crop itself. And

besides this peculiar advantage, the extreme luxuriance and verdure which common Salt gives to *grass* lands, when properly applied, would be so satisfactory to such farmers who would make use of it, and so convincing to all the neighbouring agriculturists of every description, that if only one or two gentlemen in each district were to employ it in a few instances, I am certain this mode of top-dressing would very soon engage the attention of every person in the empire, who had even but a garden to manage and cultivate.

“I think it necessary to remark, that where Salt is used as a top dressing for grass-land, the quantity employed ought to be much less than is commonly used for ground, that is to be afterwards ploughed for a crop of grain. Six bushels, or three hundred and thirty-six pounds of Rock Salt, ground *very fine*, and regularly sown upon the grass, would be a proper quantity for an acre of pasture-land; whereas sixteen or twenty bushels may be used upon fallows for cleaning the ground preparatory to the putting in the grain. For meadow-land, two or three bushels of crushed Rock Salt may be carefully sown upon each acre, immediately after the hay is got in, with great advantage, especially in hot and dry summers.

“From the evidence which has already been collected upon this subject, it is obvious that a great portion of the land in this kingdom might, by the proper use of Salt, be made to produce nearly double the amount of the present crops of grass as well as corn. How greatly this would serve the manufacturing, and indeed all other interests of the country, I need not attempt to explain to you. Moreover, by forcing the land with a sufficient portion of Salt, our crops would be brought to maturity much sooner than they now are, a matter of considerable importance in the northern parts of this island, where much of the corn is frequently spoiled by the autumnal rains before it can be sufficiently dried by the sun and wind to stack with safety. And in the hay harvest, should the farmer be induced,

from the uncertainty of the weather, to carry his hay too soon, a small quantity of Salt sprinkled upon each layer of the rick will prevent the hay from becoming now burned, as it is called; and when hay which has been thus treated is presented to horses and cattle, it will be preferred by them to that which has been put together in a more favourable season, and not treated with Salt.

“The late Dr. Darwin, in treating on Salt as a manure, remarks, that “as it is a stimulus, which excites the vegetable absorbent vessels into greater action than usual, it may, in a certain quantity, increase their growth, by enabling them to take up more nourishment in a given time, and perform their circulations and secretions with greater energy.”

“The *cleanliness* of Rock Salt as a manure is likewise another considerable advantage. In many cases this circumstance will be found to be very important, particularly in the grazing districts. It has repeatedly been observed, that if land be manured with dung *after* the hay has been carried off, the neat cattle will refuse to eat the eddish which grows upon such land. On the contrary, if a field be dressed with about two bushels of fine Salt per acre instead of dung, soon after the hay is cut, this inconvenience and loss will be avoided, and a large crop of after-grass will be obtained, possessing such peculiar sweetness, that all kinds of cattle, as well as horses, will eat it with the utmost avidity.

“The farmers, in some districts, are accustomed to steep their seed-corn in lime-water, and doubtless the practice is often useful; but I am decidedly of opinion that a strong brine, made by the solution of Rock Salt in water, will be infinitely more efficacious. Crops of wheat are often reduced one half in value by a disease to which this kind of grain is very liable, called the *smut* or *rust*; but when the seed has been properly prepared with Salt, this misfortune can never happen. It has also been proved by some public-spirited individuals, who have made the necessary experiments, that

the scab is never found upon potatoes which have grown upon land that has had a proper dressing of Common Salt.

“In many parts of Flanders, but more particularly at Lisle, it is the practice to preserve the urine of those cattle that eat Common Salt with their food. This is preserved in appropriate reservoirs, and when the farmers apply it to a certain description of land, which experience has taught them to select, the effect, even without any other manure, is not only advantageous, but it is truly astonishing.”

*Extracts from old writers of credit on the employment of
Common Salt in Agriculture.*

Gervase Markham, a learned writer in the reigns of James the 1st and Charles the 1st, who was equally noted for his skill in many foreign languages, and for his knowledge of the various branches of agriculture, published a great variety of treatises on the management of land, and closed his agricultural labours by the publication of a work entitled “*Markham’s Farewell to Husbandry*,” in which the following passages occur. “If you be neer unto any part of the sea-coast, thence fetch great store of the salt sand, and with it cover your ground which hath beene formerly plowed and hackt, allowing unto every acre of ground threescore or fourscore full bushels of sand, which is a very good and competent proportion; and this sand thus laid shall be very well spread and mixed among the other broken earth. And herein is to be noted that not any other sand but the Salt is good or available for this purpose, because it is the brine and saltnesse of the same which breedeth this fertility and fruitfulness in the earth, cheaking the growth of all weeds, and giving strength, vigor, and comfort, to all kind of grain or pulse, or any fruit of better nature.”
Page 5.

“Now methinks I hear it objected, what if the ground do lye so farre within the land, that there is no salt-sand

within many score miles of it, how then shall I make good my barren earth? To this I answer, that albeit this salt-sea sand be of infinite good and necessary use, enriching grounds wonderfully much; but if your ground lye much within land, and farre from the sea, then to every acre of land you shall take two bushels of very dry bay-salt, and in such manner as you sow your wheat you shall sow this salt upon the ground; then immediately after the sowing of the salt you shall sow your wheat, which wheat would be thus prepared before you sow it. The day before you are to sow your grain, you shall take bay-salt and water, and mixing them together, make a brine so strong that it will bear an egge; then put the wheat you are to sow into that brine, and let it steep therein till the next day; then drain it from the brine and so sow it; and no doubt but you shall find a marveilous great increase thereby. Neither is the thing itself without good and strong probability of much increase, and strength for the bettering of all manner of arable grounds; for there is nothing which killeth weeds, quicks, and other offences of the ground, so much as saltness." Page 12.

In the chapter respecting the treatment of land over-run with weeds, he directs such land to be covered with a certain black plant growing on the sea-shore, which is to be plowed in, and the ground harrowed; it is then to be sown with pigeons' and pullens' dung mixed together, allowing to every acre two or three bushels thereof, and he adds, "but in case you can neither get Salt, sea-sand, nor sea-weeds, then you shall by no means omit the steeping of your seed, neither shall you fail before you sow your seed, to mixe with your pidgeons' and pullens' dung a full equal part of bay-salt well dried and broke, and so sown with the dung upon the land, and then the seed after it." Page 17.

In chapter V. entitled "of the ordering of all barren clays that are over-run with ling or heath," after giving directions how to make and dress the land, he adds, "And if the ground have been sanded (with salt sea-sand) you may

sow your seed-wheat simply of itself, without any doubt of the plentiful increase thereof; but if it have not been sanded, then you shall not only steep your seed in brine, but also you shall mixe your seed with bay-salt, and so sow it into the ground." Page 27.

In the chapter which treats of the method of recovering such land as had been rendered sterile by the overflow of sea-water, Mr. Markham writes thus:

"In all my former relations, touching the bettering of ground, I do apply, as one of my chiefest ingredients, salt-sand, salt-weeds, salt-water, salt-brine, ashes, and many other things of salt nature, as indeed all the manures and marles whatsoever must either have a salt quality in them, or they cannot produce fruitfulness; so that it might be argued, if Salt be the occasion of fruitfulness and increase, then there cannot be much hurt done by these overflows of the salt-water, that it should rather adde a fattening and enriching to the ground, than any way to impoverish it. But experience shews us the contrary; and that there is nothing more noisome and pestilent to the earth than the superabundance and too great excess of saltness, &c." Page 50.

"In the chapter on enriching of barren grounds for the growth of hemp and flax, he directs first to plough it, "then with the salt sea-sand, you shall sand it very plentifully, but if that be not to be gotten, and you be very well assured of the natural richness of the earth, you shall then sand it with the best red sand you can find near unto you, and upon every acre of ground you thus sand with fresh sand, you shall sow three bushels of bay-salt, and then plough up again the earth, sand and salt together, which should be done about the latter end of the yeare, as after Michaelmas, and so let the ground rest till seed-time, at which time you shall bring sea-weeds to your hemp-land, and cover it all over with the same, and then you shall plough it again, burying the weeds within the earth. As for the weeding of this ground, you

shall not respect it at all, for *it will put up no need.*" Pages 67 and 69.

In the chapter on vermin, Mr. Markham says. "The next great devourers of grain are pismires or ants, which although it be but a little creature, yet it is so laboursome, that the grain which they carry away or destroy, amounteth to a great quantity. If you manure your corn lands with ashes or salt sand, you shall be well assured it will never breed pismires." Page 75.

"The great Lord Bacon, who flourished early in the seventeenth century, having noticed the advantages which the farmers of Cornwall, Devon, and other maritime counties, derived from the free use of sea-sand, which upon those coasts chiefly consists of broken shells impregnated with salt-water, declares that the best manure next to marle is sea-sand, which no doubt, (says his Lordship) obtaineth a special virtue by the salt-water, and concludes by affirming that salt is the first rudiment of life."—*Nat. Hist. Cent. 6. Exp. 596.*

In the Philosophical Transactions, is a memoir by the Archbishop of Dublin on the manuring of lands in the counties of Londonderry and Donnegall, in Ireland, with sand and shells from the sea-shore, from which I extract the following passages. Treating of boggy land, he says:—"The turf is nothing but the product of vegetables, which rotting, there remains only the earthy parts; now shells being chiefly salt, the salt incorporates with the sulphur of the plants, and renders them fit for the vegetation of new plants, which further appears from this, viz.—that those shells which have been under the salt-water, are much better than such as lie dry on the strands. Some thousands of acres have been improved by these shells, and what formerly was not worth a groat per acre is now worth four shillings. Some years ago they made lime of the shells, and manured their lands with it, but a poor man, who, from laziness or poverty, had not provided to make lime, threw the shells unburnt on

his land, and his crop proved as good as his neighbours, and the second and third crop better ; and all took the hint, and have used them so ever since. Where shells are not to be procured, sea-wrack or sea-sand supply the want.”—*Phil. Trans.* No. 314.

Soon after the formation of the Royal Society, Dr. Bury delivered a memoir, containing an account of the manuring of land in Devonshire with sea-sand, which is much to our purpose. “Salt,” says he, “quickens dead land, and is used in the south-west part of that county, which would otherwise be the barrenest, but is now the richest part thereof. The inhabitants go as far as the sea will permit them at lowest ébb, take the sand in bags, and carry it on horseback fourteen miles into the country, and spread it on the land, thereby improving it both for corn and grass. Crude Salt alone, if strewed upon the ground, does not improve but corrode it.”

Extracts from more modern writers on the use of Salt in Agriculture.

“I am well assured from a Scotch gentleman, that they have long used Salt in that part of Great-Britain, always sowing ten or twelve bushels by hand of their coarse Salt on an acre of young green wheat, sometime in November, December, January, or February, it being, from the several accounts which I have had of it, very effectual in the *killing of tender weeds* amongst corn, yet at the same time *cherishing the corn* ; and though it does not add altogether to the bulk or height of the straw, yet it does much to the goodness and plumpness of the grain. And whoever has been curious in their remarks abroad, will find that it is the usual practice of the Milanese to sow Salt on their pastures, as I have been informed by one who has sold great quantities for that purpose ; as also by a merchant of Liverpool, who is well acquainted with that trade, who affirms that the finest crops they have of hemp and flax amongst the Dant-

zickers and others, who raise those commodities in those countries, are from lands on which salt is strewed." *The Practical Husbandman*, 8vo. London, 1733, vol. i. p. 48.

"Salt certainly sweetens the grass much; and it may on all such occasions be mixed with a proper quantity of dung, which is more sulphureous than Salt, and will make grass shoot away much faster than any other manure. Lime in its own nature makes grass sour, but when mixed with Salt, that acidity will be taken away." *Practical Husbandman*, vol. i. page 57.

"As to the proportion of Salt to be used on land, it ought to be according to the nature of it; cold, wet, clayey land requiring more, and loose soft sand though it be poor requiring less. Again, the proportion of Salt ought to be either more or less, according to the crops of grass or grain you would improve. For cold, wet, and spewy land, ten loads of dung, six of earth, and eight bushels of Salt, per acre.

For lean, hungry, sandy land, fourteen loads of pond earth, six loads of dung, and six bushels of Salt per acre when employed for corn and grazing.

For meadow land, fourteen or fifteen loads of dung, five bushels of Salt, and four of pond earth, the quantity of each to be altered according to the quality of the ground." *Practical Husbandman*, London, 1738, page 59.

"On watering meadows with a solution of salt, we are directed to make a large pit about twenty or thirty feet square, and five or six feet deep, more or less, as there will be occasion, in the method tan or salt pits are made, and put therein ten or twelve bushels of salt, and as much of lime, soot, or any other ingredient of that kind, and, having a pump near at hand, or some conduit or spring of water, fill the pit up by degrees, at first to three or four feet high, letting the ingredients dissolve in the water, by being there twenty-four hours at least, stirring them sometimes about, and after that, by dipping in of the finger it will be found whether the water is salt enough (as near as you can to the

strength of sea-water) : if it is not sufficient, then may be added a reasonable quantity more of the above mentioned materials ; but if it be too salt, then more water may be poured in till it is just right and fit for use ; and being possessed of a moving pump or a skip, pump the water into a hogshead, with a leather pipe, and a watering rose at the end of it, just as is practised in watering the streets in London, and so (having the hogshead placed on a roll) may both meadows and corn land be watered to a good advantage.”—*Practical Husbandman*, vol. i. page 74.

“ To shew an acquaintance of mine the effects and advantages of Salt properly applied to vegetables, I made the following experiment, in an extreme dry summer, upon a bare piece of pasture land, out of which the cattle were all taken for want of grass : I marked four places with stakes, each of which I watered nine nights successively, in the following manner :—the first with spring water alone, to the quantity of a gallon ; the second with the same quantity of water, adding an ounce of common salt ; the third and fourth with the same quantity, mixing the water in the third place with two ounces of salt ; and that in the fourth with three ounces, which produced the following different effects.

“ The grass in the second place grew more and of a darker green than that in the first ; in the third, it only grew by spots, for a part of it was killed where the greatest quantity of water fell, and the fourth was quite brown for a greater compass than the third ; by which it appeared that an ounce of salt in a gallon of water had a better effect than the water had alone ; and that three ounces of Salt, mixed with a gallon of water, was more than the grass could immediately receive ; but the fourth place in the ensuing spring was the most fertile of them all.”—*Treatise of Fruit Trees*, by Thos. Hitt, 8vo. third edition, London, 1768, page 17.

“ Having tried Salt upon a small scale on a sandy soil, I can assert sixteen bushels to be a proper quantity for one acre. It gradually advanced in its effects to sixteen, and as

gradually diminished to forty bushels, when vegetation was destroyed. 'Twice only have I had an opportunity of buying a few tons of foul Salt, and used it both times on a barley tilth, sowing the salt immediately after the barley. The event was perfectly satisfactory. The verdure of the spring exceeded any thing of the kind I ever saw; and the ripened appearance was whiter by many shades than I ever beheld. N. B. Salt is noxious both to weeds and vermin." R. Legrand, Esq. on *Manures*, in the *Annals of Agriculture*, vol. v. page 149.

"Salt," says Mr. Hollinshead, "will be found to be the cheapest, best, and most durable manure ever yet made use of."

"When Salt is used upon pasture-lands, it may either be sown upon them in its simple neat state, after the rate of sixteen bushels the acre, or mixed with compost, mud, or loamy earth; sixteen bushels of Salt to twenty loads of earth, and turned in the heap two or three times to incorporate it properly; this compost should be laid on and spread in the autumn."—Page 13—18.

"For meadow-lands, we would advise the farmer to sow six bushels of Salt per acre, immediately after the hay is got in. This would be found peculiarly beneficial in hot and dry summers, and upon lime-stone and sandy soils; which, after they are mown, are often so much parched by the heat of the sun, that not only the eddish is destroyed, but also the crop of the ensuing year is very materially injured; but by sowing it with Salt, moisture would be attracted and retained, sufficient to assist vegetation so powerfully, as in a short time again to cover the face of the ground with grass, and by that means effectually to screen the roots, which would otherwise be too much exposed to the direct rays of the sun.

It may, indeed, be said, that dung will answer the same purpose: in some degree it might, but dung cannot always

be had, never in sufficient quantities: besides if it could, this objection lies against it, that neat cattle will not eat the eddish after dung, consequently one valuable crop is lost to the farmer, which, if Salt were used, would be both productive and wholesome. Also, the hay, when put into the mow or stack, should be sprinkled with salt on every layer. When hay is housed soft, this should never be omitted, as it would prevent what the farmers call the *mow-burn*, and make the hay far more pleasant and nutritious for the cattle in winter.”--Page 18.

“Mr. Beck, gardener in Chorley, has constantly made use of Salt in his garden for upwards of thirty years, principally upon his onions; and he has invariably found the Salt to exceed every other kind of manure which he could have used for the like purpose; his method is, to sow the Salt immediately after the seed is covered in. But as he never had any thought of communicating his observations and experiments to the public, he took no care to ascertain the exact quantity necessary to be sown on an acre, and proportionably upon any smaller quantity of ground: yet he thinks, if he might hazard a conjecture, that he has not sown *less*, and probable *more*, (of waste Salt) than *sixteen* bushels per acre. One year, by way of trial, he sowed the usual quantity of Salt upon a plot of onions, *after* they had begun to shew themselves above ground, and the crop, so far from being improved, was entirely spoiled; from this he infers, that the experimental gardener, who may be inclined to make use of Salt, will do well to throw it on as soon as possible after the seed is sown.”--Page 20.

“A farmer at Glasson, near Lancaster, has for some time been in the habit of carting Salt-water to put upon his dung whilst in the heap in the yard, before it was taken to be spread upon the ground, which he has found by experience very much enriches the dung, and makes it better manure. A great advantage might also be derived to the far-

mer from spreading sea-sand under and amongst the dung, whilst it is in collecting, during the winter, and also in the cow-house, stable, and yard, not only on account of the particles of the Salt contained in it, but likewise by its retaining and absorbing the urine of the cattle, which is itself a very excellent manure."

"A farmer in the county of Sussex, some years ago, had a field, one part of which was very wet and rushy, and the grass produced upon it was of so sour and unpleasant a kind, that the cattle would not graze upon it; he tried several methods to improve it, but to little purpose; at last, having heard of the benefits of Salt as a manure, he determined to try that; for which purpose he procured a quantity of Rock-Salt, which in a random way, without any regard to the precise quantity, he threw upon this rushy ground, fencing it off from the other part of the field; the first effect of which was a total disappearance of every kind of vegetation. In a short time after, however, it produced the largest quantity of mushrooms ever seen upon an equal space of ground in that county. These in the spring following were succeeded by a most plentiful and luxuriant crop of grass, far exceeding the other part of the field in the richness of its verdure and the quickness of its growth: the cattle were remarkably fond of it; and though the Salt was laid on it *upwards of twenty years ago*, this part is still far superiour to the rest of the field."—*Appendix to Mr. Hollinshead's pamphlet*, page 33—35.

"Salt is the mother of all manures, as every kind of manure is higher or lower in value according to the Salt it produces; and every kind of manure is portioned out to the land according to the quantity of Salt or nitre it is thought to have in it. Formerly, Salt was thought to be an impoverisher of land, but experience has taught us wisdom: it is now found to be otherwise, provided it is duly proportioned to the state the land is in, and mixed to mollify it as follows:

take ten bushels of Salt, and six bushels of dry ashes, and mix all together ; then spread them on the land, and harrow them in with the seed : this is a sufficient dressing for an English acre, as it is better to repeat the dressing than to lay too much on at once. By being thus mixed, one particle incorporates and mollifies the other. Salt itself is rather too severe and harsh in its nature, and if laid too thick on, might prove of bad consequence ; but if conveyed into the earth by a soapy, smooth method, will prove the real enricher the earth wants to send forth vegetation ; this dressing will last for three crops. Sea-weed, shells, fish, sea-water, sea-sand, have in them a proportion of salts or nitre, and, therefore, must be esteemed a manure.”—From C. Varley, Esq. *communicated to the Chester Chronicle by the Rev. B. Dacre of Mosely near Manchester.*

“ The following curious anecdote may be related as serving to illustrate the effect of Salt : Mr. Seckler made a little heap of earth in the midst of a field, on the top of which a cart load of refuse Salt was thrown ; the earth in the heap itself, and (after its removal) the earth under it, for upwards of two feet deep to the clay ; was rendered so perfectly barren, that the most common weeds would not vegetate in it. This barren earth, however, furnished the richest dressing for the remainder of the field. Mr. Seckler found Salt the best preservative against the mildew in wheat. When the wheat followed turnips with Salt, it escaped the mildew which attacked other fields which were not salted ; and this he finds to hold universally good, as far as his experience goes. The improvement of bad hay, by Salt applied in the proportion of about one hundred weight to three tons, and sprinkled between the layers, is very striking, preventing mildew, and rendering it more grateful and beneficial to cattle, especially if the hay is bad : and even in good hay it is very greatly ameliorated. A testimony in favour of the benefit of Salt is furnished by the striking fertility of the

land in the neighbourhood of the sea-shore in Cornwall; more especially in those situations which are favourable to the general distribution of the saline spray, as is exemplified in the parish of Fennor."

"An interesting detail from the Rev. E. Cartwright will be found in the fourth volume of communications to the Board of Agriculture, which is conclusive, as to the application of Salt as a manure for potatoes. It appears from this communication, that the experiment could not have been tried on a soil better adapted to give impartial results. Of ten different manures which were resorted to, most of them of known and acknowledged efficacy, one only excepted, *Salt* was superior to them all. Its effects, when combined with soot, were extraordinary, yielding in a row two hundred and forty potatoes, whilst one hundred and fifty only were produced from the row manured with lime. It was observable also, where Salt was applied, whether by itself or in combination, the roots were free from that scabbiness which often infects potatoes, and from which none of the other beds (and there were in the field near forty more than made part of the experiments) were altogether exempt."

"Sea-sand is very generally used in the county of Cornwall for manure, and the quantity which is every season carried away from different parts of the coast for the purpose of manure almost exceeds belief. From Bude, in the parish of Stratton, it has been ascertained that in one day as many as four thousand horse-loads have been taken; and from the harbour of Padstow, it has been computed, that fifty-four thousand cart loads are annually carried. The expense of land carriage for sand, used in the county, has been considered as amounting at least to thirty thousand pounds annually.

"That the beneficial operation of this sand depends upon the presence of calcareous matter, there cannot be any doubt, but, at the same time, we are borne out by unequivocal

cal facts, in believing that the Sea-salt, with which it is impregnated, contributes materially to its fertilizing powers."—Dr. Paris' *Memoir in the Transactions of the Royal Geological Society of Cornwall*, vol. i. 8vo. London, 1818, page 193.

Extracts from Papers published by the Right Honourable Sir John Sinclair, Baronet, on the Uses of Salt for Agricultural Purposes.

"Salt, if employed in large quantities, in its natural state, is hostile to vegetation, yet it operates advantageously, in various ways, when judiciously applied to arable land. In large quantities it has a tendency, like every other excessive stimulant, to disorganize and destroy the vegetable substances with which it comes in contact ; but in moderate quantities it promotes the growth of vegetables.

"It has been proved by Pringle, and Macbride, that though Salt will, in large quantities, prevent putrefaction, owing to its antiseptic properties, yet that it has an evident tendency to promote the process, when used in small quantities. Hence the advantage of mixing it in moderate quantities with farm-yard dung, and other animal and vegetable substances.

"An experiment was tried in Cheshire, of mixing grass roots and other rubbish barrowed off the land, with foul Salt ; it was then incorporated with other manures ; and the effects of this compost, on a crop of barley and grass seeds, is said greatly to have exceeded the most sanguine expectations that had been formed of it.

"A farmer mixed up a quantity of refuse Salt with the earth taken out of water furrows, and another portion of the same earth with lime. Of the two, the vegetation of that part of the field which had the salt compost laid upon it, was by far the healthiest and most vigorous.

Vermin. Salt destroys vermin in the ground, by making them void the contents of their bodies, such evacuations being too powerful for them to withstand. It has this additional advantage, that the vermin thus become food for those very plants, which otherwise they would have destroyed.

Turnips. "Equal quantities of salt, and of turnip seed, were tried on a small plot of a garden, by the author of this paper; and the produce was more abundant than from the same quantity of turnip-seed sown without Salt. The efficacy of Salt, as a destroyer of the turnip fly, or beetle, ought to be ascertained."



ON THE ADVANTAGES OF OXEN IN PREFERENCE TO HORSES.

Brighton, 10th Feb. 1820.

DEAR SIR,

THE decision of the Committee on the last ploughing match, caused some animadversion, in consequence of their rejecting the performance of Mr. DERBY's plough on account of his *horse* team. It has also led to inquiries, as to the relative merits of oxen and horses for *road* teams; and as you will observe, that the Trustees have excluded horses from competition at the next ploughing match. It is desirable to collect all the experience possible, of the advantage of oxen in preference to horses for the *road*; and I believe, sir, no person can afford more practical information on the subject than yourself, from the important use of ox teams in the war of the revolution, particularly while you was quarter-master-general. Though a stripling at that period, I can well recollect, that the principal transit of stores and provisions for the army, from New-England, was performed by ox-teams. This fact was confirmed by Dr. EUSTIS in a

late conversation relative to the present object of inquiry, who at the same time remarked, that the heavy ordnance intended for the siege of York-Town, could not, without great delay and difficulty, have been brought up, had not the quarter-master-general had the *foresight* to order oxen from New-England for that service. These facts are, in my opinion, of importance to the Agricultural interests of the nation, and should be promulgated.

Will you have the goodness, sir, to communicate such information on the premises, as may occur to your recollection.

With particular esteem,

I am respectfully, yours,

S. W. POMEROY.

Hon. TIMOTHY PICKERING.

Wenham, Feb. 29, 1820.

DEAR SIR—

It was not till yesterday that your letter of the 10th instant came to my hands. With pleasure I comply with your request, by communicating what knowledge and information I possess, of the use and value of oxen for the road, and for all the labours of husbandry.

You particularly mention the employment of ox-teams, in the public service, in the war of our Revolution. The considerable destruction of horses in the operations of the war, and the great expense of procuring and supporting them; induced me, in the winter of 1780—81, (at which time I held the office of quarter-master-general,) to cause ox-teams to be provided for the campaign of 1781. These were obtained, of course, in New-England, where alone they could be furnished: and they fully answered my expectations.

When in August, 1781, disappointed in the expected co-operation of a French fleet, against the enemy in New-York, the commander-in chief decided on the expedition against the British army under lord CORNWALLIS, in Virginia, I received his orders to provide for moving the troops destined for that service. The ox-teams effectually performed the transportation of baggage and stores, to the points where they were relieved by water-conveyances. From the head of Elk, in Maryland (sixteen miles eastward of the Susquehannah,) to James' river in Virginia, the ox-teams, (without loads,) travelled expeditiously. The heavy artillery, shot, shells, &c. brought from the head of Elk, by water, were landed on the shore of James' River, I think at or near James' Town, whence they were transported by the ox-teams, to our camp before Yorktown, a distance, I believe, of about fourteen miles. In the performance of this service, those teams were of essential importance.

The late Col. JEREMIAH WADSWORTH, of Connecticut, (one of the most judicious and efficient men in business that I ever knew,) was then the contractor for supplying the French army with provisions, teams, carriages; in a word, with every thing necessary for it, in the quarter-master's and commissary's departments. I introduce his name, because he had provided a great number of ox-teams and waggons, for the use of the French army during the same campaign; and these also travelled to Virginia.

I always understood that the great transportation of provisions and stores, from Massachusetts and Connecticut, to the troops on Hudson's river, was almost wholly performed by ox-teams, during the war.

Just at the close of the war, in the summer of 1783, I recollect being at the house of an Agricultural gentleman of Princeton, in New-Jersey, where Congress was then sitting; and that CHARLES THOMPSON, the Secretary, was present.

One of ARTHUR YOUNG's Agricultural Tours, in England, lay on the table, and gave rise to a conversation on the use of oxen for the draught, particularly when geared with collars, hames, and traces, like horses; and Mr. THOMPSON, related the following fact, now, for substance, perfectly in my recollection. Travelling in that part of Chester county, in Pennsylvania, which lay between Lancaster, in that state, and Newport on Christiana Creek, Mr. THOMPSON fell in with a team of a novel character in that country, being composed of one pair of horses and one pair of oxen; and the latter were accoutred with harness like horses, only with the collars turned upside down. His curiosity being excited, he stopped, and made some inquiries; and received from the driver an account as follows; that he and a neighbour, each having a horse-team and waggon, had entered into a contract to transport a quantity of flour, (I think in a given time,) to Newport: that in the midst of the work, one or two of his horses failed, (fell sick or died,) and he was not in circumstances conveniently to procure others; but he had a pair of oxen, and he concluded to try whether they would supply the place of his horses; that he made the experiment and succeeded. He told Mr. THOMPSON, that the oxen were more useful to him than horses; for after some fall rains, when the roads had become miry, he continued to carry his full complement of barrels of flour, while his neighbour's horse-team frequently getting stalled, (the familiar term in Pennsylvania, when a team gets set fast in a slough) compelled him to lessen his loads. But he added, that in returning from Newport with their waggons empty, his neighbour had the advantage in speed; although none in the actual performance of the contract.

Horse-teams for the road are universal in Pennsylvania; at least, in the many years I resided there, I do not recollect observing any other. But I have noticed some of their

teams of large horses travelling at as slow a rate as any loaded ox-teams in New-England.

I have been inclined to entertain the opinion (perhaps an erroneous one) that oxen might be trained (beginning with their first acquaintance with the yoke) to a greater quickness of movement than is common; and that this might be rendered habitual. I have seen a pair of oxen in a plough keep pace with another plough drawn by a pair of horses. And Sir JOHN SINCLAIR, in his account of the Improved Scottish Husbandry, mentions two distinguished farmers, of the name of WALKER, who, contrary to the general practice of their neighbours, persisted in the use of ox-teams, as profitable on their farms. Two oxen, harnessed like horses, in a plough, performed the same labour, without losing a turn. After the experience of twenty years, these farmers pronounced oxen fit for every agricultural labour, travelling on *hard turnpike roads* excepted.

It would seem that horse harness is generally, if not universally used for oxen in Scotland, the collars being reversed. Sir JOHN SINCLAIR says "the principal objection to the use of oxen is the difficulty of shoeing them." The facile mode of shoeing oxen in New-England, would remove that objection: and I take the liberty of suggesting the propriety of the Trustees of our State Society of Agriculture, communicating to Sir JOHN, a drawing and description of our simple frame and apparatus for shoeing oxen, for the information of British Agriculturists, to whom we are so much indebted for instruction and examples in the most approved practices in Husbandry.

I subjoin, from Sir JOHN SINCLAIR's book, his statement of the expense of supporting *one plough*, in Scotland.

Mr. BROWN of Markle keeps twenty work horses.

The food of each, in 1812, was £35 0 10

Interest of money, wear and tear, 7 10 0

————— £42 10 10

Amount brought over	-	£42 10 10
The same for the second horse,	-	42 10 10
Horse tax, smith's account, and keeping in use harness and im- plements,	- - - - -	12
<hr/>		
Total expense for one pair of horses,	-	£97 1 8
The Ploughman, including all emoluments,		38
<hr/>		
Total expense of one plough, in Sterling money,	- - - - -	£135 1 8
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In dollars, 599 72; 28 cents only short of \$600. For the horses alone £97 1 8, equal to \$431. Does the support of a pair of good working oxen cost a New-England farmer more than a fourth part the latter sum? It is true, that the open weather of a British winter enables the farmers to plough and do other farm work during a good, perhaps the greater, part of that season; and consequently their horses require good feeding then, as well as in other seasons.

The WALKERS break their steers for work at three and a half years old, and work them till they are six and a half, when they are fattened. "The ox improves, (Sir JOHN remarks) until six or seven years old; and is then easily fed and brought to market, at a greatly increased weight and value." Another Scotch farmer breaks his steers at two years old, giving them only light work so as not to prevent their growth. At that early age they will be more docile. Such, and for the same reason, I suppose, is the common practice of New-England farmers. Besides that an ox ceases to gain in size after he is six or seven years old, he perhaps begins to abate somewhat in his activity; and both these reasons may operate with the WALKERS then to fatten them.

I am pleased that the Trustees of the State Society, "have excluded horses from competition at the next plough-

ing match." We have done the same for our first essay in Essex: because we would not encourage the substitution of horses for oxen, in the great labour of a farm.

I am, dear sir, with great esteem,

Your obedient servant,

TIMOTHY PICKERING.

S. W. POMEROY, Esq.

*First Vice President of the Massachusetts
Society for promoting Agriculture.*

Wenham, April 22, 1820.

DEAR SIR—

SINCE the perusal of your letter of the 3d instant, in reply to mine on the subject of ox-teams, there has occurred to my recollection a paper, to the same point, in the first volume of the *Memoirs of the Philadelphia Society, for promoting Agriculture*: it is a letter from William Ashford, to John Vaughan, Esq. Mr. Ashford, says—"There is another thing in which I was wrong in not taking your advice, viz. not keeping oxen instead of horses: this spring all my horses became sick, and I was forced to buy a pair of oxen. I supposed I should be tired of them; but on the contrary, I am tired of horses; as I find that with my two oxen, I can do more work than I could with four horses, and with half the expense. I have worked horses for forty years, and if I had used oxen in their place, they would have put five hundred pounds in my pocket. My oxen go to the lime kiln once a week, twenty-one miles, in the morning, and return the next day in the forenoon: after resting two hours, they go to work—horses cannot do this."

This testimony of an experienced farmer of Pennsylvania, whose prejudices were opposed to the use of

oxen for labour, and where horses, with very few exceptions, constitute the farmers teams, is peculiarly valuable.

I am, dear sir, with great esteem,

Your obedient servant,

TIMOTHY PICKERING.

S. W. POMEROY, Esq.

ON INDIAN CORN AND ITS CULTURE.

Brighton, 29th Dec. 1819.

[To the Corresponding Secretary.]

DEAR SIR,

IN an article published in the 4th number of the last volume of the *Agricultural Journal*, entitled "*Remarks on the Agriculture of Massachusetts*," the author, who very ably and satisfactorily points out the advantages of a regular rotation of crops, observes, that "no system is likely to be easily made popular in Massachusetts from which Indian corn is absolutely excluded."—May not strong reasons be offered, why any system to be generally practised, must embrace that grain as a prominent item of the course? It forms the basis of our bread-stuff, and gives deserved reputation to two great staples, *Beef* and *Pork*; without corn you get none of the latter;—and a farmer who has no pork in his tubs, may be considered as fairly on the road to ruin, as a Bank with its vaults destitute of *specie*, for it is well known that ruta бага, potatoes or carrots *alone*, will not fatten such pork as our farmers or fishermen have been accustomed to, or that will be found profitable for consumption.

A *Virginian*, in a *Treatise** which I have lately perused, remarks, that “even a nation which has lived with *Indian corn* and almost upon it for two hundred years, so far from correctly estimating its value, have only learned to eat it, but not to avail themselves of half its properties.” And I trust it will not be deemed superfluous to portray the advantages resulting from its culture, to *New-England men*; when it is considered that the *prejudice* against it, and which will exist against any crop that requires such diligence to obtain, has been fostered, and increased by the few unfavourable seasons preceding the two last—besides, some influential gentlemen, with views highly laudable, have advanced theories, founded on isolated facts, or opinions, tending to discourage the extensive cultivation of this plant.

It is admitted, that on most farms near sea ports, where corn and *manure* can be purchased, the system of potatoe and root culture, to the *exclusion* of corn, may be found profitable; nor would I be understood other than an advocate for such a system, in a regular rotation, upon an extensive scale; but I wish at the same time to hold up to view, the *GOLDEN FLEECE* found by our *Pilgrim Fathers* on their first landing; and which, had it not existed, or continued with their descendants nearly a century after, the *fair inheritance* we now possess, in the opinion of many sound political economists, could not have been transmitted to us.

Unfortunately we have no precise data, to test a crop of corn with other productions; and in considering its value, must have recourse to general reasonings—to the effects of

* A series of Agricultural essays entitled *Arator*, by Col. John Taylor of Caroline County, Virginia.—Though adapted to the agriculture of that, and the adjoining states, will be found to contain valuable practical and useful information to the *New-England Farmer*.

its extended culture since the settlement of the country, and particularly since the introduction of its pretended *rival* and valuable *auxiliary* the potatoe.

Let us inquire in the first place, what corn-husbandry returns from an acre of land, as usually managed. On suitable soils well tilled and manured, an average crop may be estimated at *forty bushels*, weighing 2400 lbs. of the most nutritious substance to be found in the vegetable kingdom, north of the latitude of the *sugar-cane*—and which can be preserved with ease, for a number of years,—you have the *fodder*, if seasonably and well cured, is, in the opinion of judicious farmers, equal to half a ton of good *hay*—then comes three or four tons of *pumpkins*, should the season favour, fifty or an hundred bushels of *turnips*—and, not unfrequently, a comfortable supply of *white beans*!—No wonder that plenty of the necessities of life, are as sure to follow large crops of corn, as effect succeeds cause in any department of physics!

I am aware that it is the general opinion that corn is a very exhausting crop,—much more so than potatoes; but is it correct? has there ever been exhibited the result of a solitary experiment to confirm this opinion? no process in farming admits of greater facility to test a question of this kind—few farmers but have at times, corn and potatoes under similar culture in the same field—has the wheat or barley, the clover or grasses that followed, been more productive on the part occupied by the potatoes, than that by the corn? Experience demonstrates that the *larger the crop of corn, the better the succeeding crop*; this was asserted by Dr. Elliot, the father of New-England husbandry, in his *Essays on Field husbandry* published in 1747; at which period it appears, that *oats* usually succeeded corn, and possibly, in some districts, such a murderous course has continued; and it is probable that CORN, after support-

ing its *allies*, the *pumpkins*, the *beans* and the *turnips*, from the provisions charged to its account, has to answer for the deteriorating effects of oats ; the most inimical to grass of any plant that can be named. Moreover, it will be recollected that formerly, the rich alluvial bottoms or intervals were planted with corn, without a particle of manure, for a number of years in succession, till the product was considerably reduced ;—would *potatoes* or any *root* crop, with such management, have continued more productive ? and hence, has not the reputation of corn materially suffered ?

We will next inquire, what return does corn make to the SOIL ? I cannot answer so well, as by quoting from *Arator*, the treatise before alluded to. “ Indian corn may be correctly called meal, meadow and manure ; it produces more food for man, beast and the earth, than any other farinaceous plant. If the food it produces for the two first was wasted, and men and beasts should thence become poor and perish, ought their poverty or death to be ascribed to the plant which produced the food, or to those who wasted it ? Is Indian corn justly chargeable with the impoverishment of the earth, if the food it provides for that is not applied ?

“ If the theory which supposes that plants extract most or all of their matter from the atmosphere, and that the whole of this matter is manure, be true, then that plant which produces most vegetable offal must be the most improving crop, and it will hardly be denied that Indian corn is entitled to this pre-eminence.”

“ Let us compare it with wheat. Suppose that the same land will produce as much grain of the one as of the other, which in its use will make equal returns to the earth. Here the equality ends, if indeed it exists even in this point. The corn stalks infinitely exceed the wheat straw in bulk, weight, and a capacity for making food for the earth. If any attentive man who converts both his stalks and straw into manure, will compare their product in April, when he

may distinguish one from the other, he will find in the former a vast superiority in quantity. The English farmers consider wheat straw as their most abundant resource for manure, and corn stalks are far more abundant ; corn therefore is a less impoverishing, because a more compensating crop to the earth, credited only for its stalks, than any in England. In comparing crops, to ascertain their relative product, and operation on the earth, we must contrast farinaceous crops with each other ; and consider the litter or offal they produce, not as wasted, but as judiciously applied to the compensation of the land. At the threshold of the comparison, corn exhibits a return from the same land of more offal, or litter, in its stalks alone, than wheat does altogether. But to the stalks of corn, its blades, tops, husks and cobs, remain to be added, each of which will nearly balance the litter bestowed on the land by wheat." The author concludes his encomium upon Indian corn, with observing, that "as a fallow crop, it is unrivalled, if as fallow crops ought constantly to do, it receives the manure."

Arthur Young who has given such an impetus to rural economy, and to root culture particularly, in Great Britain ; in his travels through France in 1789, makes the following remarks respecting Indian corn. "The line of maize (corn) may be said to be the division between the good husbandry of the south and the bad husbandry of the north of the kingdom, till you meet with maize very rich soils are fallowed, but never after ; perhaps it is the most important plant that can be introduced into the agriculture of any country, whose climate will suit it. The only good husbandry in the kingdom, (some small rich districts excepted) arises from the possession and management of this plant. For the inhabitants of a country to live upon that *plant*, which is the preparation for wheat, and at the same time keep their cattle fat upon the leaves of it, is to possess a treasure, for which they are indebted to their climate."

“Planted in squares or rows so far asunder, that all imaginable tillage may be given between them; and the ground thus cleaned and prepared at the will of the farmer, is an invaluable circumstance; and finally it is succeeded by wheat. Thus a country, whose soil and climate admit the course of—1st. maize, 2d. wheat, is under a cultivation that, perhaps, yields the most food for man and beast, that is possible to be drawn from the land.”

This celebrated agriculturist, a few years after his return from his travels, met with a native of *Connecticut* in London, and on being informed of the face of the soil and population of that state to a square mile, observed, “they must consume all, or more than they raise!” but when told that a large surplus was exported, expressed his astonishment; and eagerly inquired “what is their principal culture?” the reply was, “*Indian corn*.” He immediately remarked “that accounts for the wonder.” The culture of corn still enters largely into the agricultural system of *Connecticut*,—and what is the consequence? Let one of her most revered* poets answer.—

“Fell Famine sickens at the o’erflowing good
“And, hissing, flies the native land of food.”—

A general failure of the crops of corn in New-England, cannot be traced to more than four seasons since its first settlement, and those, occasioned principally by autumnal frosts, and owing in some measure, perhaps, by an improper choice of soils. The last failure (1816) might in a great degree have been prevented, had proper attention been paid to this circumstance; and also to the selection of *early varieties for seed*, as it is a fact, that there are very productive varieties in the country, which, if planted the first of June, will be secure from frost the first of September!

* The late President Dwight.

The mode of culture generally in Massachusetts does not differ essentially, from that taught our ancestors by the aborigines ; warm soils were chosen—an *alewife* or some other *fish*, was put into the ground with the seed, and as the Squaws had no other implement than a *clam-shell*, hills were formed with the earth that could be most easily obtained ; and hills have been the order to the present time. Is it not probable that, unincumbered with stumps and rocks as a great portion of the arable lands of the state now are, and with the vast acquisition of implements, that a different process would produce much greater crops, with less labour ? We have seen by publications, under the sanction of respectable societies in the western parts of the state of New York, that on *ridges* or in *rows*, more than one hundred and twenty bushels of corn have been obtained from an acre ! three times the quantity we estimate as an average crop ! It is true that our soils cannot boast the fertility of that new region ; but it is also as true, that our farmers will not yield to any for enterprize and perseverance.

The introduction of that *magic substance*, gypsum or Plaster, which exhibits such astonishing effects upon corn, and is obtained almost as cheap as sand from the sea beach, has begun to form a new era in the husbandry of the state ; may we not presume, that by the aid of this substance mixed with manures, in their raw state, and also applied as top dressings of the plants at every time of hoeing, till six or eight bushels are expended to an acre, instead of one or two, as is usual, that the most encouraging results may be expected ? The utility of plaster, has been tested in almost every town in the state, situated 15 or 20 miles from the sea board. The invention of machines for its more easy pulverization, and so cheap, as to be within the reach of any considerable farmer, is a desideratum.

The perfect culture and copious manuring demanded by corn, may be said to be the principal objection to its more extensive cultivation; ought not this to be the very feature which should recommend it? Has not the Drill husbandry been the means of exalting **BRITISH AGRICULTURE** beyond that of any other country? and what is a well managed field of Indian corn, but a most complete drill system? The depth the roots will penetrate, if encouraged, and from the structure, and volume of the stalk and foliage presented to the atmosphere, it seems peculiarly adapted to resist the severe droughts of our climate;—its superiority in this respect over any other crop we cultivate, I believe will not be questioned. And, if the agriculture of New-England has heretofore been entitled to any pre-eminence, compared with that of other sections of the union, the cause may be attributed partly, perhaps, to the more general use of *ox-teams*, but principally to this thorough tillage required by our soil and climate,—and for which the most grateful returns are made.

On the whole, the conclusion, to my mind, is irresistible, that should Indian corn be made the basis of an extensive rotation system, with a pointed attention to the manures, which it has the capacity to increase in a compound ratio, the agriculture of Massachusetts may not only approximate to that of Great Britain, but with the energies such a system might be expected to elicit, equal it.

The enlogist of Indian corn, whose method of cultivation differs from that of his neighbours, may be expected to submit some account of it; and I feel less reluctant to the task, since I find a mode very similar, and with corresponding views, has been practised and recommended by such an accomplished cultivator, and physiologist, as Col. Taylor, the author of the treatise before referred to. It may be proper to state, that I was induced to adopt this method from the following occurrence. Having a large bed of

Beets planted in narrow rows or drills, in the usual way, and a severe drought ensuing, the leaves were observed, in the middle of the day, to wilt and fall down, in all but the out-side rows, which remained erect and flourishing; and when the crop was taken up, were nearly double the size of those from the centre of the bed! That a greater exposure to the atmosphere, was the principal cause could not be doubted; and the idea immediately presented, that if they had been cultivated on *ridges* so far apart as to permit a plough to pass, it would in effect, be making the whole crop *out-side-rows*: and for upwards of fifteen years since, all the arable crops upon my farm have been cultivated on ridges with manifest advantage,—as to product, labour, and the *unquestionable* improvement of the soil. The ridges of beets, carrots, parsnips, turnips and ruta-baga, are about two feet, cabbages four, and corn and potatoes five feet and an half apart. The particular mode of cultivating carrots was communicated to Hon. Mr. Quincy in 1811, and included in an article on the *field culture of carrots*, furnished by him and published in No. 1. of the 4th Vol. of the Massachusetts Agricultural Journal, a mode practised by that gentleman with such success, that his neighbours who have large *milk establishments*, have been induced to adopt the extensive culture of this root, so valuable for their cows, and which, some of them have informed me, they should have been deterred from attempting in the common method, from the expense and uncertainty.

But to return to the culture of corn; in describing which, that of potatoes must necessarily be embraced; as I deem it a species of *heresy* for two crops to succeed each other when it can well be avoided; nevertheless, as potatoes should be employed as the *pioneers* of a farm, and it is frequently the case that cold, moist, or rough soils, not suitable for corn, are found, sufficient to be occupied by as many potatoes as the farmer can well manage, or may want, under

such circumstance, the permitting two crops of corn to follow, *on ridges*, may be justifiable; whereas in the common method it should be considered as unpardonable.

If we begin the system with *sward* land, it is broken up in the autumn; harrowed fine in the spring, and light furrows run out five feet and an half apart: into these furrows, potatoes are dropped from six to eight inches asunder, according to size, the carts follow and cover them with manure; a furrow is then turned from each side so as to meet over the manure, a little labour with the hoe may be required, to make all level and complete the planting; other furrows are turned up, and at the first hoeing the baulk is cleared and the ridge completed. In the subsequent culture the plough approaches only the sides of the ridges, and continues deepening the furrow between them. The following spring, the ridges are reversed and placed directly over those deep furrows. The manure is turned in while the ridges are forming; or by opening a furrow on the top, to receive it, with a pair of oxen walking on each side, covered with hoes and the corn planted. If the land is in good heart, and manure abundant, the kernels may be six inches apart, or as many dropped together as to insure four stalks to remain two feet apart, in which case the manure is deposited conformably; either method will give the same number of plants to the acre; I think four stalks together afford support to each other against winds, and are not so apt to send up suckers as when single, and there may be some advantage by concentrating the manure, in forwarding the young plants during the cold seasons which we frequently have in June; still I have not had sufficient experience to determine which method is preferable; if the land is *stony*, the last will be found most convenient. As soon as the plants appear, the earth is stirred about them with the hand, and ashes at the same time strewed on, in the proportion of a handful to four plants, (my land being

near the sea, plaster has no effect,) the cultivation proceeds similar to that described for the potatoes—the ploughing continues as often and as long as you please, without disturbing the roots of the corn, or breaking it down, deepening the soil and turning up the dead earth to the sides of the ridges, which checks the growth of weeds greatly; and if the crop is at first thoroughly hand weeded, they will give but little trouble afterwards.

It has not been in my power to make a comparison with a crop cultivated in the common method, but I have had several foremen since ridging has been practised on the farm, who were at first prejudiced against it, but were soon convinced of its utility; and none of them have estimated the increase of product, with the same quantity of manure, at less than one fifth, and the saving of labour full as much.

It is probable that on rich soils with plenty of manure, larger crops may be obtained by making the ridges much nearer, but the labour will be more, and the advantage of uncommon deep culture, without extra expense, must be abandoned; the importance of such culture to the succeeding crops, may be illustrated by the following relation.

About fifteen months since, I was applied to, severally, by two respectable farmers, from an adjoining town, who are considered as judicious and as *thrifty*, as any in the county of Norfolk, to be informed how I had managed a piece of land, the former state of which they had well known, to make it produce such a *second* crop of clover, in such a season of drought, that theirs was *dried up*, and on land naturally more moist, which they considered stronger, and had been well cultivated and highly manured? They were told in reply, that “the land was under the sixth course of a rotation.—viz. 1. potatoes, 2. corn, 3. carrots and beets, 4. corn, 5. spring-wheat, of which it carried thirty bushels of 59 lb. 6. clover, first crop two tons and an half, second the same season, and which had attracted their notice, about one ton to the acre.” That it had from 16 to 20 lb. of

clover and half a bushel of herds-grass seed to an acre ; one half ploughed in with the wheat, and the remainder sown on the furrow, harrowed in and well rolled : and further, that no stock were suffered to graze upon it." It should also be stated, that a heavy crop of herds-grass was produced the last season, and that it gives promise of another ;—that the soil is a deep sandy loam, known to many farmers by the name of *fox coloured earth*, and which some of them are too fearful of turning up ; that when first cultivated, in the common method, which was some years previous to the present rotation, it did not shew two inches of brown soil or vegetable mould, and had been considered as poor pasture. And I would observe, that had the land been longer under previous cultivation, the 3d and 4th courses might have been omitted, and the rotation thereby shortened two years.

I will close this communication, now much longer than was intended, by mentioning that I have found the following preparation of SEED-CORN; effectual in protecting it against squirrels, and other vermin. Take equal parts of tar and train oil, simmer them together and turn over the corn ; then sift on ashes, lime, or plaster, stirring it, till each kernel has taken up as much as will permit its being conveniently handled.

It is probable that *walnuts, acorns, chesnuts, &c.* thus prepared, would be protected ; the destruction of which by squirrels, has very much retarded plantations of those valuable trees.

I remain dear sir,

respectfully and cordially, yours,

S. W. POMEROY.

JOHN LOWELL, Esq.

*Corresponding Secretary of the Massachusetts
Society for promoting Agriculture.*

REVIEW OF A "TREATISE ON AGRICULTURE, COMPRISING A CONCISE HISTORY OF ITS ORIGIN AND PROGRESS—THE PRESENT CONDITION OF THE ART, ABROAD AND AT HOME; AND THE THEORY AND PRACTICE OF HUSBANDRY, WHICH HAVE ARISEN OUT OF THE PRESENT STATE OF PHILOSOPHICAL ATTAINMENTS IN EUROPE. BY A PRACTICAL FARMER." Albany: printed by J. Buel, 1820.

THERE is no department of knowledge, (we have not the temerity as yet to call it science) to which the attention of the people of Europe, and of the United States, has been of late more assiduously turned, than to that of Agriculture. Of its importance, compared to that of any other art or science, there cannot be any division of sentiment; it being unquestionably the most important, and the source of the prosperity and success of all other arts and sciences.

Yet it has so happened, probably because its professors and cultivators are less instructed and informed, generally, than those, who are employed in the other departments of human knowledge, that it has hitherto been in low estimation; and it has been taken for granted, that this, of all other arts the most important, can be brought to perfection by unassisted experience, and that science cannot, as it has in all others, contribute to its amelioration and perfection. It would be difficult to assign the reasons for this general prejudice against the application of principles of sound reason and philosophy to this important art. Perhaps they may be found in the unsuccessful *practical* exertions of men, who have cultivated it theoretically. They have generally lost money by their experiments; and the practical, but less informed cultivator, who has been a greater gainer upon the amount of labour and capital laid out on his farm, has been disposed to ridicule the expensive experiments of his better informed neighbour, which, owing to

his want of practical skill, have been more expensive than profitable to him.

Yet if this rule were applied to the other arts which contribute to the wealth and prosperity of a nation, it would be perceived, that the ingenious artists, who are the inventors of machines for the abridgement of human labour, or for perfecting of the various processes of manufacturing industry, are generally victims to their own ingenuity and zeal, and that it is, after all, only the practical man, unacquainted with the principles on which the improvements were effected, who has derived any solid benefit from the discovery or improvement. The truth is, that the pioneers in all the arts, are generally destined to die in a poor house, while those who avail themselves of their discoveries and hints, often make for themselves and families an abundant and noble establishment.

In this country, though more decidedly agricultural than almost any other in the world, there have been fewer and more feeble attempts to reduce the art to a science, than in any other country ancient or modern. Till within a few years, our farmers could trust only to the uncertain tradition of their ancestors, and each man followed the practices of his father, or of his neighbour, without knowing what improvements had been made, in other countries, since the emigration of our ancestors. The art must necessarily have degenerated with us, because the mode of culture required in clearing up new lands, must have been essentially different from that, which was applicable, and indeed indispensable to lands which had been long cultivated, and the vegetative powers of which had been in some very considerable degree exhausted. It was only after our lands had been generally cultivated, and worn out by a negligent and careless course of husbandry, that we could expect any effort to supply the defect, which exhausted nature required.

Within a few years our attention has been awakened to the subject, and the effect of this attention can be known only by attending to results. It is believed that only twenty years since, there can scarcely be produced a case in which three hundred bushels of potatoes, or seventy-five bushels of corn, were ever produced on an acre of land.

We formerly read with astonishment and doubt, the accounts of the enormous products occasionally raised on well conducted farms, in Europe. Now we have seen, that partly by an attention to a spirited cultivation, to an increase of the quantity of manure, and by the emulation excited by the rewards offered by agricultural societies, there have been produced crops, which will bear a comparison at least with the average produce of the best cultivated districts of Europe.

The periodical Journals of the various agricultural societies in the United States have been rapidly increasing in their number and interest, and men of science and agricultural experience have also, occasionally, by their publications, done much to awaken an attention to this subject; to enlighten, inform, correct, and improve our modes and processes in agriculture.

Among these efforts, the work mentioned at the head of this article deserves a very prominent place.

It is no undeserved compliment to the author (entirely unknown to us,) to say, that he has enjoyed the rare advantage of an extensive acquaintance with the works of all the nations of Europe, ancient and modern; that his library must have been well furnished—his knowledge of ancient and modern languages much greater than commonly falls to the lot of a “practical farmer.” With all these advantages, his work might have been a confused, incoherent and useless display of learning; but it is not such. His arrangement is lucid, and well digested. His selections judicious; and the whole compendium (for it is but a compendium) uncommonly comprehensive and well adapted for the

higher class of cultivators. We use this term, (offensive as it may seem in our republican country), in a very innocent and inoffensive sense. We mean, that his work is rather calculated for the *reading*, than the *practical* part of society; for those who think, rather than those who labour. It ought to be compared with the works of Kirwan and Sir Humphrey Davy, rather than with those of Arthur Young, of Mr. Taylor of Virginia, or of Dr. Deane. Still we hail it as a great acquisition to our stock of works on agriculture. If agriculture is ever destined to become a science, and like that of architecture and shipbuilding, to extend its beneficial influence through society, it must commence its operations by amusing, instructing, and exciting the reading and thinking part of the community. Through them, thoughts and suggestions, which are of value and importance will be disseminated through the whole community. If experience shall prove them to be useful, like the invention of the quadrant and compass, they will be adopted and used by thousands, who know nothing of the principles on which they were proposed or invented; if otherwise, they will fall like many other efforts of genius and talent, to be heard of no more.

The general divisions of this work, and it is but a brief one, are—

- SECTION I. Of the rise and progress of agriculture.
- II. Of the actual state of agriculture in Europe.
- III. Theory of vegetation.
- IV. Of the analysis of soils, and the agricultural relations between soils and plants.
- V. Of practical agriculture and its necessary implements.
- VI. Of manures; their management and application.
- VII. Of tillage, and the principles on which it is founded.

- VIII. Of a rotation of crops and the principles on which it is founded.
- IX. Of the plants recommended for a course of crops and their culture.
- X. Of other plants useful in a rotation of crops, and adapted to our climate.
- XI. Of meadows.
- XII. Of orchards.
- XIII. Of Farm cattle.
- XIV. Of the Dairy.

Every intelligent agriculturist will perceive, that this synopsis embraces almost every topic interesting to a farmer, and he would expect to find one or more volumes of several hundred pages each; and he would think it impossible to discuss all of them, as this writer has done, in the short space of 168 pages. No doubt much more might have been said, and the work would have been invaluable had the same talent, and knowledge, and industry been employed in giving us a full display on these several topics; but short as it is, it may be safely affirmed, that very few works have ever appeared in this, or any other country, which have given so much condensed and important information in so small a compass.

We do not mean to say, that we concur in all the opinions of the writer; we differ from him in many of them; but we think, that those who have not access to an extensive library on agricultural subjects, will find a mass of information, with regard to the state of agriculture in every part of Europe, which they will find extremely entertaining and useful.

We now propose to give some sketch of the various subjects discussed by the author.

The first section contains a very brief, and rather meagre account, of the history of agriculture among the ancient nations of Europe and Africa.

The second section professes to give the actual state of the agriculture of Europe.

After speaking, with just contempt, of the culture of the Campania of Rome, where formerly twenty-three cities flourished in a territory, in which the modern traveller is astonished and depressed at the silence and desolation around him, he proceeds to Tuscany, where the soil, though less fertile than that of the Campania of Rome, is covered with vines—with grain—and with cattle. The Tuscans have adopted the system of a rotation of crops, which consist of either three or four years, in the following order :

1st year. Wheat, and after wheat, lupins.

2d year. Wheat, and after wheat, turnips.

3d year. Indian corn or millet.

In the four year rotation.

1st year. Wheat, and after wheat, beans.

2d year. Wheat, and after wheat, lupins.

3d year. Wheat, and after wheat, lupinella, or annual clover.

4th year. Indian corn or millet.

It is observable that such a course would only suit a country, whose season is so long, and mild, as that of Tuscany.

The Piedmont and Milanese agriculture is next noticed, and the opinion of Arthur Young is quoted, in which he states that these territories are the most rich and flourishing of any in Europe. The soil in this favoured country yields annually and uniformly, two crops of grain or three of grass. These effects are the produce of irrigation.

France, this writer considers as uniting the great desiderata of an extended and profitable agriculture, fertility of soil, mildness of climate, a dense population, an enlightened government, and facility of exportation, beyond that of any other European state.

This praise, almost without qualification, has induced us to believe that something more than the partiality produced

by a dispassionate examination of the relative state of agricultural improvement in the various countries of Europe, has influenced the opinions of the writer. His intimate acquaintance with French writers; his ample references to them, as authorities, had led us to believe that he was, (though an American practical farmer), a Frenchman by birth and education. Still the merits of his work are in no degree affected by this circumstance, though it may influence his opinions, and materially affect his judgment. It ought therefore to induce us to examine more cautiously his sentiments in relation to the actual state of agriculture in other nations.

The same preference for the agriculture of France has induced the author, when considering the state of English agriculture, to speak rather contemptuously of it. His impartiality is poorly vindicated by admitting some faults in the French system of fallows, and some other more unessential points. For ourselves, we are persuaded from personal observation, that the culture of Great Britain is far superior to that of France.

It certainly is so, as to neatness, and freedom from weeds and noxious plants. You do not see the fields of wheat brilliant with the scarlet poppy, and other flowery plants, which show off the wheat fields of France to so much advantage. You do not see the peasantry so miserably clothed, nor loitering along the highways, watching two or three half-starved cows and sheep, and with the aid of a sagacious shepherd's dog, preventing these animals from making more than half a rod's inroad into the wheat field. We were astonished to hear Great Britain censured for the indifferent management of her *cattle*.

To be sure the author quotes certain British writers in proof of his assertions; but in our humble opinion, these sentiments were thrown out rather to stimulate the English farmers to greater exertions. It would, indeed, be extraordinary, if the French or any other nation should surpass

the English in attention to their animals, since the capital bestowed on such subjects, the institutions in favour of agriculture—the rewards, ten times exceeding those awarded on the continent, ought to produce, (if encouragement and honour can produce any effect,) a greater attention to the improvement of their domestic animals, than could be expected from the meagre and scanty efforts made in the rest of Europe.

In fact, no person who has travelled in Great Britain and on the continent of Europe can doubt, that the races of domestic animals, the horse, the ox, and the sheep, are in a higher state of improvement in England generally than in any European nation. Perhaps we may except the sheep of a small part of Germany (Saxony,) but it is much to be doubted, whether, regard being had to the carcase and fleece, and to the varied uses to which British wool is applied, even the sheep of any part of Europe are superior to those of Great Britain.

The author has given some calculations to shew the low state of agricultural produce and profit in Great Britain. But the Edinburgh reviewers, who cannot be taxed with a disposition to overrate their own country in a comparison with any other, in the 64th number of their review, in a comparison of the state of French and English skill and industry, have seemed at least to make the English agriculture and its relative produce far superior to that of France. Nor is it very easy to perceive, in what the fallacy of their statements consists. By this comparison it would seem to result, that, although the surface of the British Isles is only as 64½ millions of acres to 130 millions in France; and although there are more uncultivated lands in proportion in England than in France; although it is admitted by our author, and by every person who is acquainted with the subject, that the climate of France is superior, yet the actual value of the whole produce of the land in England (the quantity of which is less than one half) is to that of France

as 21 to 19. We confess, after many years acquaintance with both countries, we were prepared for such a result. We have thought the general system of agriculture in Great Britain better; the people employed in agriculture are stouter, more vigorous, better clothed, much better fed; the animals employed in agriculture far superior; the implements of agriculture better made, and better adapted to the purpose incomparably than those of France. The system of living in villages, and riding or walking several miles to begin their work, is disadvantageous to the French cultivator. Their want of fences and hedges must cost the nation annually an immense sum. On the whole, therefore, we must at present beg leave to dissent from the opinion of this ingenious writer in his comparison between French and British culture. This opinion arises from no national prejudices; but if these examples are set forth either for our information or imitation, it is important that we should have a correct view of them.

There is one fact, which is very important in estimating the comparative state of British and French agriculture, and that is, the price of the fee-simple of land and of rents. The taxes are lower in France than in England. Yet it is true, we believe, that while the price of land in England is from 25 to 28 years purchase, or (to explain it to our citizens who are not accustomed to this mode of estimation) while land in England, which rents for £4 sterling, or 17 dollars 76 cents, is worth £100, or \$444 44, that of France is not worth more than from 15 to 20 years purchase, or would not sell at the same rent for more than 350 dollars per acre. Besides which, the rents of land in France generally, are from 25 to 50 per cent. lower than those of equal quality in Great Britain.

The section on the theory of vegetation is, though not new, yet an ingenious and lucid display of the doctrines at present received on this subject; and as its tendency will probably be to promote an attention to the nature of our

soils, and to adapt our manures and our cultivation to the character and qualities of our land, we are pleased to see the subject brought forward in a country, in which science has never till lately been brought to lend its aid in the promotion of this art.

The same general remarks may be applied to the section on the analysis of soils. We do not enter into a detailed account of these two sections, because it would lead us into too wide a field for the object we had in view, which was to recommend this work to the attention of our theoretical cultivators.

The next section considers the subject of the instruments of agriculture. After giving a short history of the plough in its various stages of improvement, from the remotest times to the present day, the author makes some very brief description of the various parts of that valuable instrument, and of its most approved construction. He adds a table, by which it would seem, that M. Guillaume's (French) plough when compared to Small's (English) Rotheram plough, as tested by the Dynamometer, was two to one in favour of the French plough. We hope this hint will induce the Agricultural Society of Massachusetts, where means are the most ample of any in the United States, to introduce one of these French ploughs; but we were rather surprised to find no notice whatever of Freeborn's plough, especially in a work written in New York.

So far as our short experience has gone, we were disposed to believe that this plough of New York invention, or at least introduced from that state among us, had properties, which entitled it to a preference over any plough of foreign or domestic fabrication we have yet seen.

We agree with the writer as to the English threshing machine, that it is both too complicated and too expensive for common use; but we think that there have been one or two inventions with us to abridge the labour of threshing, of a simple and cheap construction, which deserve great

encouragement, and which promise to produce an important saving of labour. Mr. Hotchkiss', of Vermont, is among the number—and one invented in Londonderry, in New Hampshire. If the merit of that of Mr. M'Keen, of Poughkeepsie, is any thing like equal to the sanguine description of its inventor, (we mean no disrespect to him in expressing this doubt, but we know that inventors are sometimes deceived) it will probably supersede them all, and we should be happy to hear further respecting it, and to see it in operation. Our premiums on this subject, are still continued; but the instruments heretofore submitted, have been and will be continued to be examined, with a caution and prudence at once liberal and discriminating, as far as our judgment will permit.

The lands of this state are not generally devoted to the smaller grains, and such a machine is of less value to us than it is to the wheat-growing states; but still we should be very desirous of encouraging any labour-saving machine, as it would liberate our farmers from a work which is only a tax on their produce, and by which they would be enabled to devote more time to the essential improvement of their farms.

In the 6th section the author enters upon the subject of Manures. In this he discusses the interesting questions, whether long or short dung, or whether rotted, or dung not rotten, is to be preferred? Whether dung used superficially, or ploughed deep into the soil, is most beneficial? Whether extraneous matters introduced into the dungheap are useful or pernicious? Whether stable manures are best applied directly or indirectly to wheat crops? At what time manures are best applied, and in what quantities?

As to the first question of rotten, or unfermented dung, the writer says, that careful experiments have proved the correctness of theoretical writers. Those parts of the field, to which rotten dung was applied, gave the best crops the *first* year; but those in which long dung, or unfermented

manure was applied, gave the best crops the second and third years. So that he draws the inference, that where we wish to obtain a great crop for one year, rotten dung should be chosen; but where we wish for permanent improvement, we should prefer unfermented manure.

With respect to the question of laying the manure on the surface, or ploughing it in very deep, he is opposed to both methods; to the first, because the rains dissolve and carry away many of its pieces; to the second, because it is laid too deep to undergo the requisite decomposition, to produce which, air and heat and water are indispensable.

He is decidedly in favour of making the compost bed, or manure heap of various materials, both of animal and vegetable origin.

He opposes the direct application of manures to wheat crops, in which we fully concur, not only for the reason assigned by him, that it is apt to produce an abundance of weeds, but because it forces the plants to a preternatural growth; subjects them to the very serious evil of being lodged by rains at the season of maturity; procrastinates that season; and on the whole the crop is more liable to blight, than if such forcing had not been applied.

As to the question of the quantity of manure to be applied, he is not very definite, nor indeed can any general rule be adopted, so much depending on the nature of the soil and its previous state. He remarks justly, that land may have too *much*, as well as too *little* manure. The former tending to produce too much stalk and leaf, and injuring the flavour of the vegetable; and the latter not giving as much force to the plant, nor enriching the soil for future culture, as would be useful and profitable.

Lime, he thinks, should be principally used in composts, and when applied directly to the land should be moderately employed on account of its causticity. He is opposed to the system of paring and burning on dry and grayelly lands, and thinks it is applicable only to marshy, boggy soils, where there is a superabundance of vegetable matter.

He is much disposed to favour the system of ploughing in green crops for manure; and he places buck-wheat at the head of the plants to be used for this purpose. He however quotes the practice of Spain, and (we may add) the Western Islands in favour of the white Lupin. We wish this experiment may be fairly tried in our state, not that we believe that in the vicinity of the great towns where other and richer manure can be obtained in such abundance, the system of ploughing in green crops will ever prevail extensively; but in the interior, where farms are understocked, and where no foreign manure, not produced on the farm, can be procured, we believe this process may be successfully used. If one fair experiment could be made on the white lupin on an extended scale, and it should be found, as in Spain, to be a valuable manure, the seed could be annually imported and might form a valuable article of commerce and agriculture.

In his 7th section, on Tillage, he states that the scientific opinion is in favour of fall ploughing, because to the action of air and moisture it adds the power of frost, whose septic or dividing power is second only to that of the plough; and because one ploughing at this season is equal to two in the spring, when labour is so much more valuable. But in this mode of culture he reminds us that we ought to ridge, as well as plough, so as to carry off the surplus water. Our own experience is strongly in favour of fall ploughing, for both of the reasons assigned; and we are happy to find this practice gaining ground in New England.

He thinks the practice in English husbandry, of frequent ploughings, has been carried too far, though he admits it was the favourite doctrine of the Roman farmers. He seems to sneer at it as the conceit of the Dilettanti, or Gentlemen farmers, and not applicable to profitable culture generally.

We are grieved to see this suggestion, because we believe there is no danger of our erring on this side, and that

much good would be obtained by stimulating our cultivators to a much more liberal use of the plough, than any to which the most industrious of them have been accustomed. After all, they cannot do too much to produce a perfect division of the soil, and they are in no danger of running into ruinous expense on account of any theoretical opinions. They follow the theoretical farmers at an awful distance; and if they could unite their own œconomy and experience to the results of theoretical experiment, they might be gainers; and if they should find they were not so, there is no danger of their continuing to follow unprofitable guides. The evil is, that they are too apt to reject practices, because they are new.

As to the depth of ploughings, he considers it ought to be governed by circumstances; by the character of the soil, whether shallow or deep; and by the plants you propose to raise, whether top-rooted or fibrous. This is in general true; and it is equally true, that the deeper you plough, the greater quantity of manure will be required; but it ought not to be questioned in this age, that deep ploughing, even if it brings up a portion of the subsoil, is permanently beneficial to the land. There is no land which is not benefited by trenching, and no ploughing can equal the effect of the spade in trenching. To be sure, you will require more manure for a year or two, but your land will afterwards repay you ten fold for this first labour. We have tried the experiment on shallow soils, the subsoil sand or gravel. We do not bring the subsoil to the surface, but we loosen it by the plough; and we contend that even the graniferous plants, and especially all the perennial ones, trees in particular, are essentially benefited by deep ploughing.

As to the question, whether level or ridge ploughing is to be preferred, he thinks the former is to be used on light and dry soils, and the latter in clayey or wet ones. We should rather say, that in *all* soils, ridge ploughing is to be

preferred, as exposing the land more perfectly to the action of frost, unless on declivities, where perhaps a light, loose soil, thrown up in ridges, would be exposed to be carried off entirely, or very considerably, by heavy rains.

The writer of the article under review, seems to have reserved all his energy for the section upon the rotation of crops, of which we shall give a more ample account, not only because we concur in his opinions generally, but because we believe it is a subject less understood, seldom judiciously practiced, and more important than any other, to which our attention, in New England, could be directed.

Indeed we know nothing among us, which deserves the name of a succession of crops, except it be the fashion of breaking up our grass lands, when they cease to be productive; and after two or three years culture of potatoes, and Indian corn, laying them down again to grass with barley, rye, or wheat. It may be, that our course of husbandry is the best adapted to our soil and climate; but we are not as yet fully satisfied of this fact, and we should like to see extensive experiments as to the effects of a succession of crops of different plants. The author of this review divides the subject into two distinct heads. The practice of Europe, and the rotation best adapted to our own soil, meridian, and markets. He begins by stating, that it has long since been discovered, that the soil when *left to itself* was never either exhausted, tired, or idle, "but that, however, impoverished by men or animals, it hastens to cover itself with plants of a different, and often opposite character." This fact is notorious and undeniable. This remark, made by observing men, led to the adoption of a succession of crops, conforming as far as their limited means would admit, to the spontaneous productions of nature. "It led, in short, to the system of a succession of crops; and wherever it has been introduced, beneficial effects have followed; and, wherever it has been neglected, agriculture has been either stationary or retrograde." Yet he re-

marks, that in the very face of these obvious truths, farmers continue to resist this cheap and obvious mode of ameliorating their lands.

“On the rotation system, the whole arable part of a farm is divided into four, six, or eight fields, and subjected to a course of crops, denominated according to these respective divisions, into the short, the medium, or the long course. In constructing these courses, attention is paid to the nature of the soil, viz. in soils more wet than dry, more compact than porous, more hard than friable, the course is made up from the following plants—wheat, oats, buck-wheat, the gramineal grasses, beans, vetchlings, clover, cabbages, and chiecory.” “In soils of an opposite character (dry, porous or friable), the plants from which to choose are rye, spelts, barley, potatoes, turnips, lupins, Indian corn, clover, sainfoin, and many of the pasture grasses.” His general rule is, “*never to select for a crop, plants not adapted to the soil, nor to permit two crops of the same species or kind to follow each other.*”

We would simply remark that we believe this rule rather too rigorous; for, admitting (what is not as yet sufficiently established,) that there is a solid ground for the opinion of modern theorists, that the earth can only furnish a certain quantum of food adapted to a particular plant, though it may abound in other food fitted most perfectly for other plants; yet no experience has yet proved, that the earth will not bear for several years in succession the same plant to advantage, nor that a change before the pabulum of such a plant has been exhausted, would be profitable. We know that the opinion has been entertained, and experience would seem to confirm it, that onions are rather improved in point of quality and productiveness, by being raised many years in succession on the same land; and we are not sure that on an extensive scale, it would not be best for two or three years to raise potatoes, or, in short, any other plants, till we find the crop begins to lessen.

Would not this after all be a wiser rule for general adoption, not to change the plant until it shall appear to deteriorate either as to quantity or quality? We have a full belief in the general doctrine, that there is a necessity of changing the culture and the plants to be raised, but we doubt whether it be necessary or even profitable to subject this rotation to invariable rules.

His second section, on the rotation of crops, is limited to that which is best adapted to our own soil, meridian, and markets.

It should be kept in mind that the pamphlet under review is the production of a *Western New York farmer*, and therefore to be received with some qualification, in Massachusetts.

He commences this part of his subject with the work of Mr. Strickland, a gentleman well-known to many of us; one of the most respectable and impartial English cultivators, who have as yet visited our country. After remarking that New England was not a *corn* country, (by which an Englishman means a *wheat* growing country) and had little to do with *the plough*, and that New York was then, and would continue to be, the granary of America, he proceeds to divert his British readers with sundry details as to our state of culture in 1801, when he was here. Before giving these details, we stop merely to say that though New England is not a wheat growing country, yet he was mistaken in supposing that even at that time we had little to do with the plough. It is to be doubted, whether, even at that period, New England did not keep as many ploughs in action as any part of the United States, in proportion to its extent; and although its staple growth, that of Indian corn might appear to an English farmer who had not visited the continent, as an inferior product, yet Arthur Young and the Baron Humboldt might now tell him, that it is at least to be doubted, whether it is not the most valuable of all the grains raised for the food of man or inferior animals.

We proceed to his details:—"The usual course of crops in New York is, first year, Indian corn; second, rye or wheat; third, flax or oats; and then a repetition of the same as long as the land will bear any thing; after which it is laid by to rest—(we presume he means by this, that is left as fallow.) A Dutchman's course on the Mohawk is, first year, wheat; second and third years, pasture without seed; fourth, oats or flax; and fifth, Indian corn.

He classes New Jersey, Pennsylvania, Delaware and Maryland together, from a resemblance in soil, climate, and culture. There they raise, first year, Indian corn; second, wheat; third and fourth, rubbish pasture, (or we suppose fallow.) Clover is however beginning to be introduced in these states. Two exceptions are however noted by Mr. Strickland. "In the German settlements of Pennsylvania, where, from more attention or skill, the wheat crop averages from eighteen to twenty-five bushels per acre—and the peninsula of Delaware and Maryland, where the rotation of Indian corn, wheat, and rubbish pasture, (or fallow) has reduced the average produce to six bushels per acre; in some instances to two, and *much is so bad* as to be ploughed up again."

We are surprised that Mr. Strickland should not have paid more attention to the culture in New England, where thirty bushels of Indian corn may be fairly assumed as an average crop; and although we have no systematic course of succession, yet we have always avoided the negligent and destructive course of fallows. Suppose the labour applied to be equal on the lands of the middle states and those of Massachusetts, we are persuaded that the actual amount of profit is much superior in New England to that which is obtained in those states, if the facts stated by Mr. Strickland and others, which have been stated to us in regard to these states, may be relied upon. There is one thing which is calculated to deceive both European travellers and our own citizens, who visit the

various parts of the United States. The farms even in the Middle states, are large, in the Southern, very large. The establishments are on a great scale. The culture is very extended for each individual, the whole produce of each cultivator appears enormous to one accustomed to our limited mode of cultivation, but when either expense or product be accurately examined, it will be found that the less fertile lands of the North furnish more food for man and animals, and yield a greater profit than those of much more favoured states. We shall conclude this review in our next number, having devoted as much of the present as was proper, and enough to recommend this work to all our readers.

[To be continued in our next.]

ON THE COMPARATIVE VALUE OF THE OX AND THE HORSE
IN AGRICULTURE; AND AN ANSWER TO THE QUESTION,
SOMETIMES ASKED, WHY THE MASSACHUSETTS AGRICUL-
TURAL SOCIETY HAVE NEVER OFFERED PREMIUMS FOR
THE RAISING OF THE FINEST HORSES?

THIS subject we propose to discuss, and we are indebted for the greater part of the suggestions, to one of the trustees of this society, who has sent us his reflections on the subject, under the signature of "A Middlesex Farmer." In his opinions, facts, and reasonings we fully agree. This has long been a contested point in Great Britain, and it is well known, that many of the ablest, and most scientific cultivators in that country have contended, that the prevalent practice of the farmers of Great Britain, in preferring the horse to the ox, was injurious, expensive, and the effect of long established prejudices. Perhaps this long perseverance in an unprofitable practice, in a country, in other respects so well instructed in agriculture, as Great Britain, may be accounted for by the great attachment of the opulent gentry to the pleasures of the Chase, and of the Course—

and to the gambling spirit produced by the last. So universal an attachment to this noble animal (so useful wherever despatch is required) has probably led the British farmer to prefer the horse to the ox in agriculture. As much pride has been excited, in having the stoutest horse for the draft, as in having the swiftest horse for the course. It should not moreover be forgotten, that where so many hunters, and coach, and carriage, and other pleasure horses are raised, as are necessary to supply the luxurious people of England, (a country which is literally studded with Gentlemen's seats,) many must be occasionally injured, and would be utterly useless if not condemned to agricultural labour. Still we are sensible that the horses generally employed in agriculture in that country, are not broken down hunters, or coursers, but are expressly raised for the plough and the cart. They are infinitely superior to any American horses for this purpose, having greater weight, more bone and muscle, adapted to slow draft, and almost as patient when obstacles are encountered, as the ox.

Had we this breed, or the Norman horse, it would be more difficult to persuade our farmers that the ox was the preferable animal. Our country horses are strong, tough, capable of enduring hardship, yet sufficiently fleet for other purposes on the road in lighter carriages; in short, they are precisely adapted to our wants—they answer for the plough, the saddle and the chaise.

It ought not to be presumed that for nearly 30 years, the trustees of the Massachusetts Agricultural Society have either been inattentive, or indifferent to this important question in agriculture. It has been often discussed, and the discussion has invariably resulted in the decision, that it is not important to *this state* to encourage the breed of horses. Among other reasons, one alone would be sufficient, which is, that although we can raise them, yet there are neighbouring states which can raise them better, and can furnish us better horses for pleasure, for the carriage and the saddle,

than we can raise ourselves. We are, in short, on the extreme northern verge in which the horse can be raised to any advantage.

The horse raised in the highlands of Scotland, becomes a mere poney—fit only for children, or old decrepit men, used only for the saddle. The noble Norman horse which mounted the Cuirassiers or heavy cavalry of Bonaparte, and which as a horse of draft is the most powerful in the world, in the eternal winter of Canada, is only a short, tough, bony, but inferior animal, capable of great endurance, and but little execution.

These are some of the general reasons which probably led our ancestors, and have induced their descendants, simply to raise a race of horses suited to light draft, and at the same time adapted to the saddle, the light cart, or waggon, and the chaise; and for these purposes, it is to be doubted whether a better race can be found than Massachusetts can boast. For the chace, for swift carriages, for excellent coach horses, we must be compelled to travel from Vermont to New-Jersey, or even Virginia.

It is to be doubted whether the Massachusetts Agricultural Society, considering the interests of the state which they are bound to consult, ought to encourage the raising of *pleasure horses*, they are mere articles of luxury. Wealth will always command them in what quarter soever they may be raised, but if the raising them in Massachusetts would not be a profitable occupation, or employment, they ought not to encourage it. If, on the other hand, they had offered a premium for the best draft horses, it would have seemed to decide the question, that the horse was preferable to the ox for agriculture, and this too, at the very moment, when intelligent men in Great Britain began to doubt of their own preference for horses. It was precisely in this state of the controversy, that the general society of this state began to offer premiums, and after much discussion, they thought that they ought not to throw their weight into

the scale in favour of the horse, when such enlightened men as Arthur Young and others, were quoting the example of the New-England states in favour of the use of the ox. The following statement comprises some among many other reasons, for the preference given to the ox over the horse in agriculture.

1. A young horse of 5 years old commonly costs (if a good animal) as much as a pair of young oxen or steers, and no one will pretend that he will do as much work, or (while young) half as much.

2. The horse will consume more than half as much as the two steers; or in other words, to keep a good horse in equally good working order, he will consume more than a steer or ox of his own age.

3. The horse is more delicate in his food. He cannot retain his flesh or strength on food, on which an ox will continue to work well and long.

4. The money you pay for a young ox is like money at interest, the longer he lives, the more he grows, and he becomes more valuable. Indeed he increases in value almost at compound interest. The exact reverse is the case with the horse. He attains his maximum of value at 7 or 8 years, and every year afterwards diminishes his value. His bulk is of no use to you because his carcase is worthless.

5. An ox, owing to the thickness and toughness of his skin, and to the length and closeness of his hair, or in other words, owing to his being probably a native of a colder climate, or being originally designed for a greater variety of climates, can endure our cold and stormy weather much better than the horse. The horse is an exotick of a warmer region, a transplanted plant, capable indeed of living and thriving, but often suffering under the severities of our seasons. The ox seems calculated for all climates. In England and the southern states, the horse may indeed endure, and even improve in vigour, but in Massachusetts he will

deteriorate, unless treated with more tenderness than farmers usually feel or employ towards their animals.

6. But the most important reason of all is, that the horse though subject to more diseases, and infinitely more tender than the ox, becomes utterly useless when he is so lame as to be incapable of work, or so old as to be of little use in labour, while the ox is often from such accidents more valuable. He has a fine appetite, soon fattens, with much more readiness than the horse, and his carcase sells for as much, or more money, than the animal would have brought in his best state.

7. Compare the harness of the ox with that of the horse, and it will be perceived that the difference is very great in favour of the former. The ox requires only a yoke which with its apparatus may cost about 3 dollars. It rarely needs repair, and when repaired, it costs little. But the harness of the horse, owing to the tenderness of his skin, and his more violent motions, must be of leather. Its first cost is much greater, we may say four times as great. It wears out sooner, and costs much more to keep it in repair while it is capable of being repaired. To this item, may be added the expense of shoes, the horse wearing his out much faster, and requiring them on all his feet the year round, while the ox needs shoes only on his fore feet during summer.

8. We will now compare the animals dead, whether occasioned by accident, or design. We cannot at present recollect any use to which any part of a dead horse in this country can be applied, except his hide, which is used for a few very limited purposes.

In England indeed his flesh sells for something for the food of hounds, and we are thankful that we have no such use for them here. We have no game laws, and but little game, and we are not therefore obliged to encounter such an useless expense, as supporting a pack of hounds on any of our estates.

The ox furnishes probably more, and a greater number of valuable articles for the supply, not of the luxuries, but the wants of mankind, than any animal in existence. His hair is necessary, and indispensibly so, to the mason in the composition of his mortar for ceilings. His hide is equally necessary for our shoes and boots, without which we could not be kept dry or well shod; and for many other purposes in manufactures. His flesh not only furnishes us with the most wholesome and best food we enjoy, but it is an article not to be dispensed with in commerce in the form of salted beef. His tallow furnishes our candles, and hard and soft soap. His hoofs afford glue. Even the tips of his horns are converted into the handles of knives, and the entire horn is also applied to some uses. When we shall have become greater economists in agriculture, the bones of this noble animal will be broken in mills and as in England, restored again to the soil where they will make an ample return as manure, for what the animal may have taken from it during his life.

With some general reflections we shall close this article. We are aware, that in England a preference is given to horses; so it is generally on the continent of Europe. Exceptions and important exceptions there are however, to this practice, and the earliest cultivators of which classick writers speak, always considered the ox the proper animal for the plough. The Jewish, Greek, and Roman farmers certainly thought the ox the preferable animal for the cultivation of land. In our own country, the Dutch, and German farmers have a preference for horses. It is indeed surprising that the English farmer can afford to raise the ox solely for the table, and keep him idle till the butcher selects him for his victim. If it were a fact that his flesh was invariably finer, luxury, and epicureans might find an apology for it, though the farmer could then hardly find an excuse for such a sacrifice, but the fact is not so. The beef of Great Britain is not finer, fatter, more tender, more juicy, better flavoured

than that of this country generally. Their oxen are not so large as ours on the whole, though it must be admitted the breed is more beautiful, better formed, and more profitable, having more flesh and less offal, but in this respect we shall soon be their rivals.

It is difficult to say why this preference has so long existed in Great Britain. It may be because the horse is so much more easily raised in their mild and equal climate; or because they have no extensive woods and rough pastures as we have in which our young horned cattle range at pleasure, in which they live by browsing in places, where the horse would starve; or because their lands are more free from rocks and stumps, and therefore they do not need so patient an animal as the ox; but we are inclined above all to account for it by the great predilection of that whole nation for the horse, as the animal whose feats they witness on the race course, whose courage, docility, and strength they experience in war, whose vigour and activity they enjoy in the chase, whose beauty and fleetness they daily witness in the saddle, the gig, and the coach. It is certain that independent of agriculture there is greater use made of the horse in England, than in any country in the world. It is an Englishman's pride and pleasure to be well mounted. They almost realize the fable of the Centaurs. They are almost united to their horses.

That the same taste should descend to the lower orders, and that the renters of farms, and the peasants who work them should be so attached to them as to be unwilling to give them up for the slow and patient and useful ox, is not surprising; but for us, let us adhere to the usage of our ancestors.

NOTICE OF A LATE WORK, ENTITLED, "THE SCIENCE OF HORTICULTURE, INCLUDING A PRACTICAL SYSTEM FOR THE MANAGEMENT OF FRUIT TREES, ARRANGED ON DEMONSTRATIVE PHYSIOLOGICAL PRINCIPLES, ILLUSTRATED BY SKETCHES IN TWELVE PLATES, WITH A COMMENTARY ON THE WORKS OF BRADLEE, HITT, MILLER FORSYTH, KNIGHT, KERWAN, SIR HUMPHREY DAVY, AND MRS. IBBOTSON." BY JOSEPH HAYWARD, GENT. London, 1818.

THIS title is to be sure an imposing one, and has the air of some degree of self-assurance; nor will this impression be lessened by the perusal of the work itself. Mr. Hayward certainly has as little respect for the opinions of those who have gone before him in the science of horticulture, as could be wished. He treats all his rivals in the character of an arbiter—condemns one, and praises some thoughts and suggestions of another, taking care, however, that none should have any right on the whole, to pride themselves on what they had done or written. Generally speaking, this arrogant spirit is most discovered by those who have the least pretensions—but it is not precisely so with Mr. Hayward. His work certainly has considerable merit. It has the merit of great perspicuity—energy—orderly arrangement, and some novelty. His high tone rather seems to proceed from a bold and fearless disregard of names and authority, rather than vanity, or contempt for others. It seems to arise from a habit of saying and writing boldly, and frankly, what the author thought, whether the effect should be to depreciate the established reputation, or adopted, and received opinions of others or not.

The book is dedicated to the president and members of the Horticultural Society of London, a body justly entitled to the highest respect, both for the respectability of its members—its objects, and the many curious, learned, and useful articles which it has given to the world.

It would appear by this dedication, that Mr. Hayward has received the most ample testimonies of the respect

and confidence of this learned society.--“Possibly it may appear to some,” says he, “that from the very flattering attention which your society have been pleased to bestow on such papers as I have occasionally taken the liberty of submitting to your inspection at various times during the past eight or ten years—your offer of publishing them among your transactions—and your professed desire of making extracts for your publick readings, ought not to have been resisted.”

The reason he assigns for not having complied with this very flattering solicitation, is, that by so doing, the author, by the rules of the society, loses all further exclusive right to his papers, so submitted.

This, then, in addition to the opinion we had otherwise formed of its merits, has induced us to bring this book before the Agricultural and Horticultural community in this State.

We shall not adopt the modern, and in many cases the absurd practice of reviewers, to put a title page at the head of, and merely as an apology for an essay, in which all the learning of the author is pompously displayed, but in which we hear nothing of the work under review.—Such a practice is very well where the work pretended to be reviewed is of no value—but it is very tantalizing when the topick is very interesting, and the author, whose work ought to be the subject of the review, is either celebrated—or we think he has had better opportunities than the reviewer, of becoming acquainted with it. In such cases, we prefer to see something of the writer himself, and to hear him speak in his own behalf.

It is peculiarly necessary in this case, because we are as yet infants in Horticultural science.—We have not yet brought into use, all the common culinary vegetables—we cultivate none of them with a skill to be compared with that of the Dutch and English gardeners. In fruits, and their cultivation—in the management of trees and grapes,

we are half a century behind them.—We ought, therefore, to bring ourselves acquainted with the progress of the science, (for it is truly a science in Europe,) and we can only do that by reading the works of their writers. To enable our readers to judge, whether Mr. Hayward's work ought to make a part of their libraries, or at least, of their reading—and also to give those who may never have the opportunity of seeing it, some idea of its merit—and to enable them to derive some advantage from the talents of the author, we shall give a full account of the work, and make, with regard to several of his topics, very copious extracts, which was the old fashioned, and very good fashioned mode of reviewing new works of merit.

After some general introductory observations and comments, Mr. Hayward proceeds to discuss the following subjects, in the order below stated.—The nature and habits of the roots of trees—On the food of plants—Chemical principles, applied to plants, and practical deductions from them—Observations and comments on the composition of soils, and the agency of earths in vegetation—On the sap of trees, its rise, and circulation—On the office and use of the leaves of plants—On the art of pruning—Methods of Hitt, Forsyth and Knight, considered—Deduction, explanation, and application of the laws of nature, for the government of fruit trees—Comments on the general mode of management of fruit trees, by nurserymen—Instructions for the management of trees in a nursery—Observations on soils, and the preparation of beds and borders for fruit trees.—[We shall omit any notice of his ample directions for the training of wall and espalier fruit trees, as not generally applicable here, and those who have expensive wall fruit, can well afford to get the book.] On the management of old standard fruit trees—currants and gooseberries—On blight and diseases of trees, and remarks on Forsyth's and Knight's plans for their restoration.

It will be perceived that the topics are well chosen, important, and judiciously arranged. It will be now seen in what manner he has treated them.

OF THE ROOTS OF PLANTS.

After speaking of the manner in which roots force themselves into the ground, their relative importance, that they form and determine the growth of the plant or tree, and its constitution, our author proceeds,

“From hence it must be concluded, that in planting trees, two essential objects present themselves for consideration. First, to ascertain the soil best adapted to afford a sufficient and accommodating body, bed, or space for the roots to repose and range in freely, and to produce and support such habits as are most desired—and next, that the soil contains, or will admit the application of a supply of food, of a proper quality, and in due quantity. And to determine this, due attention must also be paid to the situation and elevation of the roots in relation to the surface of the soil. In a deep, tenacious soil, or clay, roots can only find a free passage in clefts and fissures which are formed by its contraction; and as these openings are not close together, or numerous, the roots do not divide much, or become fibrous; but those which strike into the fissures, range wide and deep, and getting below the influence of the air, and sun, collect their food from a source ill adapted to fructification; and accordingly such trees are generally found to be of a cold, aqueous, and unprolific nature.”

“On the contrary, when the soil is light, porous, and shallow, the roots meeting no obstruction, divide and form a great number of fibrils, which, ranging horizontally, and more exposed to the effect of the sun, and air, incline a tree more to become fruitful than to an increase of wood, and an extension of branches; and in such a situation, the

greatest supply of food being appropriated to the production of fruit, the tree grows but little in size."

He then quotes the opinions of the celebrated Hitt, Knight and Miller, in support of the same sentiments, and in favour of shallow planting. We shall not insert these "quotations," because those books are to be found in every large library. We cannot resist, however, giving a short paragraph from the truly respectable Philip Miller, one of the best practical cultivators that ever lived. "Some authors (says Miller) who treat of the qualities of the earth, say it ought to be of the same quality, three or four feet down, for trees, which, (if they have not that depth,) will languish and decay after they have been planted six years. But this is not true in fact: for most trees will thrive very well, if they have two feet depth of good earth, especially fruit trees; which produce the most generous fruits, when their roots spread near the surface of the earth." We were tempted to cite this passage, not only from Mr. Miller's high character and deserved weight, but because we are persuaded, that the prevailing error with us is to plant too deeply; and we think that we remedy the evil by filling up the whole deep cavity with good soil. Such a hole is a perfect prison to the young tree, from which it can never, or with difficulty, escape. We have scarcely a tree on our own place which was not planted too deep—more recent experience has convinced us of this fact.

He then proceeds to state a theory of Mrs. Ibbotson, in opposition to these sound and practical remarks, and proceeds to refute it, as we think, successfully. To those who have not heard of this extraordinary lady, who has pushed her inquiries to a great length into the physiology, or structure, and economy of plants, it may be proper to state, that she has acquired very considerable reputation, and attracted much attention, by her investigation of the internal structure of plants, which she effected by the aid of a powerful solar microscope; but Mr. Hayward thinks

that in applying the results of her discoveries, and her theory to practice, she has made very great mistakes—a case very far from being uncommon.

Mrs. Ibbotson advanced the opinion “that it was the tap root which always forms the leading shoot of the tree, and if it is cut, it will, without doubt, spoil that part, by forming two middle stems to the tree; and as the beauty of the tree depends much on the perpendicular height of its single pillar, the custom they have in most nurseries, of curtailing the tap root, is a most vicious one.” She adds, “What is the use of the tap root? By shooting down perpendicularly to fix the tree firmly to the ground, and keep it straight in that position.” This, as Mr. Hayward very justly remarks is neither supported by the observation of nature, nor by the principles of science.—[Indeed it may be considered as a direct attack on one of the most fundamental and well settled principles both of planting trees, and of transplanting all smaller plants—directly opposed to every day’s sober experience, and therefore of pernicious tendency. The whole practice of *transplantation*, with a view to ameliorating, would be destroyed by it, if the principle were adopted. From the cabbage to the oak, the regular, well-informed nurserymen have been in the practice of shortening the tap root, or almost removing it, with a view of forcing the plant or tree to throw out smaller fibrous roots, nearer the surface. On this principle, trees the most impatient of removal, the most difficult to transplant, may be removed almost as often as you please, and almost without the appearance of suffering by the change. This opinion of Mrs. Ibbotson strikes at the root of all past experience; and we may venture to say, if adopted, would prevent the successful transplantation of many trees, which are now safely and easily removed. Thus the walnut of every kind, and the cherry, are difficult to remove, if you suffer them to stand till they have sent a deep tap root into the earth; but if removed early into a new nursery, they

are as easily managed as any other trees; because they will furnish such an abundance of small fibrous roots, as will insure their success on a second, or a third judicious removal. In short it may be affirmed as a general proposition, from our own experience, that the greater the number of small fibrous superficial roots—the more easy and safe will be the transplantation—the more readily will the transplanted root or plant become naturalized in its new situation—the less will it feel the effects of the removal, and the more rapid and secure will be its future growth.

The analogy, from the cultivation of plants in pots or boxes, according to the practice in green and hot houses, will satisfy any observing man. The roots of these plants are wholly fibrous. They are shifted or changed once or twice a year. They may be removed from one tub or pot to another, in summer or winter, or from a pot to a border, without experiencing the smallest injury, or scarcely a check. In great transplantations, or the transplanting of larger trees, the same principle should be applied. And where you have not a sufficient number of superficial fibrous roots, you should cut off not only the tap root, but such a proportion of the large lateral and horizontal roots as to oblige or force the plant to send out the competent number of small fibrous ones.]—EDITORS.

“What person,” says Mr. Hayward, “possessing the smallest knowledge of *mechanics*, could ever expect that a pole, with any substance fixed at its top, exposing a great surface to the winds, could remain straight in its perpendicular position, when set in the earth, without horizontal fixtures?” [or, as he might have said, braces?] “Indeed, the elm,” he remarks, “is seldom if ever found with a tap root, but is supported in its perpendicular position wholly by horizontal or lateral roots.” [If he had known the noble drooping elm of America, which will not thrive in England, he might have said, that this noble and most beautiful forest tree seldom sends its roots one foot below

the surface, and not unfrequently merely skims the surface, just below the grass sward. Yet who ever knew an elm overthrown? It survives, unhurt, all our furious tornadoes.]—EDITORS.

[Mrs. Ibbotson proceeds in her theory, to suppose that trees require some sorts of food or nutriment, which the surface does not afford—that probably *minerals* are wanted to form the juices of the bark—that therefore the descent of the tap root is necessary to the health and vigour of the tree. She asserts that the loss of the tap root can never be remedied; and of course it follows, that no transplanted tree can ever be equal to one suffered to stand where it was planted: an assertion contradicted by the experience of 2000 years. She also recommends throwing a great quantity of water into the hole, into which a tree is transplanted, or in the language of gardeners, “puddling it,” and also a large barrow of good mould. Now it is well ascertained that the practice of profusely watering plants on their removal, is rather hurtful than beneficial; a fine division of the soil, and treading it firmly round the transplanted plant, being much preferred.]—EDITORS.

Mr. Hayward with a great fund of good sense, replies to these remarks: “That a *tap* root or *any other* root is peculiarly adapted to supply any particular branch of a tree, (such as Mrs. Ibbotson had stated its effect to be on the leading shoot,) I very much doubt—but at any rate it is not an invariable law. Whenever any particular root is taken off, it does not alter or affect any *particular* branch, but the whole of the branches are equally affected by the privation or loss.” “A great quantity of water poured into the pit, on transplanting a tree, will often *cement* or *encrust* the earth, and render it so close and adhesive, that it will obstruct the emission of fresh radicals, or the progress of old ones, and the plant will be in consequence much injured.” [Here again we must recur to the analogy of the cultivation of smaller green-house plants, because if a

thorough drenching of water, on their removal, as is well known, either destroys them, or checks their growth, by preventing the free passage of small fibrous roots, we cannot perceive why the same effect should not follow in the coarser and less scientific and artificial cultivation of trees. It is an undoubted fact, that gardeners employed in cultivating tender plants, make the earth as fine as possible, throw it on lightly, water with great care and moderation, and if they deluge the plant with water, (though in a pot or tub, it has the advantage of much easier access of sun and air,) it will grow sickly and perish, owing to the difficulty of pushing its tender fibrous roots through the encrusted solid earth, forcibly compressed by the water. We do not see why the analogy does not hold, and our experience, and very successful experience, in the transplantation of trees, fully supports the inference which reason and analogy would make from the above data.]—EDITORS.

“Water,” says Mr. Hayward, “should be applied little and often. This will afford sufficient moisture, and keep the soil loose.”

“Mould may be a good thing thrown into the pit at the time of digging, in the quantity mentioned by Mrs. Ibbotson [a wheelbarrow for each tree] for forest trees, but it must be improper for fruit trees, for by retaining a large portion of moisture, it will oppose fructification, and endanger their health, or by affording a luxuriant supply of food, the roots may be made to increase in size, but form few in number. A few large roots, spreading wide, and running deep, may be of importance in producing large timber trees, but it would be prejudicial to a fruit tree, for as before observed, those trees are *always* more prolific when kept near the surface of the soil, and when they are much divided, or fibrous.”

This first article is a good specimen of the work, and proves, that the author unites practical knowledge to science.

His next subject is

THE FOOD OF PLANTS.

This is more exclusively scientific, and it must be acknowledged, that this department of natural history is less understood, and probably will continue for many years, perhaps forever, to be more imperfectly treated than any other. Sir Humphrey Davy's work was among the first attempts to apply the improvements in chemical knowledge to the cultivation of plants. Kirwan had entered the career before him, but much remains to be done. Mr. Hayward, in this chapter, does little more than to quote from preceding writers, the opinions and theories often fanciful, and in all cases loose, and not subject to rigorous demonstration.

That some, and very great aid, will finally be derived from the application of chemistry to agriculture, may reasonably be hoped. Its success, when applied to the mechanick arts, gives us reasonable ground to entertain this expectation.

We shall merely give a short synopsis of this chapter, in which so little is original.

"Vegetables, like animals," says Mr. Hayward, "vary in their nature and habits, and like them, have their peculiar food, for although the food of plants may generally be composed of the same materials or elements, it varies in the proportion of its composition, and thereby becomes adapted to different purposes. Thus we find a soil which will furnish only food enough to support one vegetable of a peculiar kind, will at the same time furnish sufficient to sustain many others of different species."

[This general proposition is unquestionably true, and it is almost the only one we know of, that has been reduced to certainty. That some plants will thrive only in a particular soil—that they will perish when removed from it—that

plants will grow for a given time on a soil, and will then cease to be supported by it, though other plants will flourish abundantly in the same spot, which refuses sustenance to the others, are facts settled beyond doubt. It would therefore seem that we have to seek a little farther than into the *general* question, what is the *food of plants*? because each plant may require a different species of food; and the inquiry ought rather to be, what is the particular species of food required by any given plant? There however have been incessant attempts for two thousand years to settle the question, in what does the food of plants consist; sometimes it has been supposed to be water only—at other times salts—at others carbonaceous matter—and the strange anomaly of the operation of the plaster of Paris, or gypsum, has put all philosophy at fault. No man has been able to account for its undoubted effects, unless the theory of Sir H. Davy, the most plausible, be admitted, that gypsum is a constituent part of all plants which appear to be benefitted by its application, and therefore it operates directly as a *pabulum* for such plants as require it, for their perfection, and developement, and in such soils *only* where there is a defect, either entire, or partial of this substance. This theory must stand till we have a better—and if it be the true one, it overthrows all the former doctrines on this subject, for it shews that some of the earths, and perhaps all of them must enter into the food of plants, in addition to the saline substances, gases and water. *How* they so enter, is as yet unknown—whether they are so minutely dissolved as to enter the plant in a state of solution, or whether the vessels of the plant are capable of taking up a portion of the earth itself, does not seem to be satisfactorily settled.]—EDITORS.

We shall merely give a short sketch of the various opinions of the writers on the subject of the food of plants, as cited by Mr. Hayward.

Bradlee, an early English writer on agriculture, and the physiology of plants, compares *trees and vegetables generally*, to *animals*, and as some of the latter live only on land, and others in the water, some in fresh, and others in salt water, and as the same is found to be the case with vegetables, he infers, (and we think unanswerably,) that they each require a different species of food peculiar to themselves, (and therefore all attempts to find out certain common elements for all of them, will be vain.—The only study should be to find out the species of food adapted to each valuable plant.

Bradlee, Hitt and Miller, considered salts of various kinds, to be the specific food of plants, which every species of earth contains within itself. This to be sure was loose enough, and was only an easy way, often adopted by theorists of explaining a thing which they did not understand. To this doctrine Mr. Hayward objects, and very justly, because the fact had not been as it ought to be sufficiently ascertained. He made many experiments with sea salt, nitre, soda, barilla, &c., and he concluded that salts were not in *any* degree essential to the food of plants. [But we are not satisfied with his conclusion—he has stated it too broadly, though they may not be essential. We know that all these substances are in certain proportions extremely, nay, *vastly* promotive of vegetation. They will often produce greater effects than rotten dung of animals, which is supposed to contain a great quantity of carbonaceous matter. To some plants they are almost a specific remedy for disease, and a stimulus. Thus to the asparagus, (a plant produced on the sea shore,) common salt, (muriate of soda,) is a very excellent application.]—
EDITORS.

Kirwan and Sir Humphrey Davy appear to have made some nearer approaches to the probable truth, in relation to this hidden part of the processes of nature. Mr. Kirwan observes that “the first requisite to a fertile soil is, that it

contain sufficient of the three or four simple earths, and of the soluble carbonaceous principle: the other requisites are, that the proportion of each, and general texture of the soil be such as to admit, and to retain as much water as is necessary to vegetation, and no more."

In other words, *that* soil, which is most capable of retaining a moderate degree of moisture, without holding it in too great abundance, is the best. Garden mould possesses this property in the highest possible degree. It suffers the water to pass through it freely, and yet retains a portion of it in great droughts, much longer than any other earth.

"Soils," says Sir Humphrey Davy, "in all cases consist of a mixture of differently divided earthy matter, and with animal or vegetable substances, in a state of decomposition, and certain saline ingredients. The earthy matters are the true basis of the soil. The other parts, whether natural, or artificially introduced, operate in the same manner."

Kirwan observes, "that the only substances common to growing vegetables, and the soils in which they grow, are water, coal, different earths, and salts. These, therefore, are the true food of vegetables."

Sir H. Davy adds, "that vegetable and animal substances, deposited in the soil, as shewn by universal experience, are *consumed* during the process of vegetation, and they can only nourish the plant by affording solid matter, capable of being dissolved by the fluids in the leaves of vegetables."

"The great object in the application of manures, should be to make them afford as much soluble matter as possible to the roots of the plant, and *that* in a slow and gradual manner, so that it may be entirely consumed in forming its sap and organized parts." [These doctrines, we have no doubt, are true: but they are generalizations, and have received from their authors no specific application.]

Hazenfratz and Mr. Davy, both concur in the opinion, that coal and carbonaceous matter, make an important ingredient in plants. And Sir H. Davy says, that no substance is more necessary to plants than carbonaceous matter. That this exists in a very considerable proportion, in most fermented vegetable substances, there is no doubt: but we do not perceive that Mr. Hayward, or Sir Humphrey Davy, or Mr. Kirwan, have as yet made many steps towards the increase or improvement of our manures, though they have, particularly Mr. Davy, led us to the consideration of our soils, and to the means of supplying their defects.

On the whole, we must consider this chapter "on the food of plants," as having added very little to our stock, we will not say of knowledge, (for as yet there is little which has been written upon it, that deserves the name of knowledge,) but to our *theoretical notions* on this subject.

We shall pass over his next chapter "on chemical principles and practical deductions," because we perceive in it only a feeble and imperfect repetition of certain trite chemical principles, and no practical deductions from them whatever. It is mere parade.

His next chapter is on the important subject of the composition of soils, and their agency in vegetation. The first part of it is taken up in a loose and very trite disquisition upon the nature of soils, in which there is a mixture of chemical principles, and bold assumption, furnishing, so far as we can perceive, little valuable information, applicable to practical agriculture. He concludes it with certain aphorisms, or propositions, which, though they may, or may not be true, afford little aid to the practical farmer.

The soundest opinions are, that the most fertile soils are those which are so compounded as to admit of the greatest, most minute, and perfect division, expansion and dissemination of water through them, and which contain a sufficient proportion of the carbonaceous principle of calcareous

earth, to correct acidity and putrefaction. Perhaps this part of our review will not produce an opinion favourable to the author ; but the part which we shall notice in our next number will shew his practical skill.

Southbridge, 20th May, 1820.

TO T. L. WINTHROP, ESQ.

SIR,

I wish you to give the following hint to wool-growers in your quarterly reports. Many of the wool-growers are in the habit of folding up their fleeces with the flesh side inwards, which makes it often very difficult to open the fleece ; and at the same time the small fribs, or little short pieces of clippings, adhere to it so fast that it is difficult even to pick them off, as very few will shake off. This is very detrimental to the spinning as it occasions the yarn to break, as the small fribs work into a knob. I am astonished that they should persist in winding the fleece up in that manner, as it collects all the dust ; and it is a great disadvantage to the seller ; as the wool shews to a great disadvantage, and looks so much coarser than when the inside of the fleece is outwards, I should not have supposed this hint had been required ; but I find so many lots of wool done up in the manner described, that you will oblige the manufacturers by inserting this hint in your reports. It is so difficult at times to open the fleeces, that a person cannot do so much work by one third, and even half. In one instance, I recollect I was not able to sort more than from twelve to fourteen fleeces in the course of the day.

Your humble servant,

WILLIAM BARKER.

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AN ADDRESS DELIVERED BEFORE THE MASSACHUSETTS
AGRICULTURAL SOCIETY AT THE BRIGHTON CATTLE
SHOW, OCTOBER 17, 1820. BY R. SULLIVAN.

AN eminent writer has said that *a farmer may be crushed by the weight of his own riches*. The meaning of the author is exemplified, in the disproportion of so many of our farms to the capital of the cultivator and to the number of his labourers. In surveying the agricultural districts of our commonwealth, we look in vain for the evidence of that intelligence and enterprise which the world has been willing to ascribe to the character of New England men. Those of our countrymen, who are engaged in other pursuits, appear to have a higher claim to the distinction which these qualities bestow. Not that farmers are a meaner race of men, or that they are incapable of as great efforts as other classes of our citizens. But they have chosen to display the energy of their character in every thing rather than in the appropriate labours of husbandry. And when we are heard to boast of the intelligence of the community of farmers in Massachusetts, we are not to be understood, and we say it

with regret, as speaking of their proficiency in their professional art. They appear to shrink with diffidence from the task of a scientific and thorough cultivation.

The disproportionate size of our farms is an hereditary evil. And the errors and prejudices which have accompanied it, for several generations, are deep rooted. The injurious influence of these reaches to the leading and most obvious principles of good husbandry. How many of our farmers, to obtain a greater produce, prefer to extend their imperfect cultivation to a large surface rather than to cultivate a less surface well! In the former case less skill is required, and less perfection in the implements. How few think it important whether their kine be of an improved or of an ordinary breed! With their extensive pastures, it is thought, the dairy may be as cheaply supplied from a greater number of indifferent animals as from a smaller number of a better quality. Then, at the close of the season, the cattle are sometimes left to subsist on the old fog of the ample fields until the snow falls, and occasionally browse in the woods. When the storms of winter have driven the cattle to the fold, the numerous herd are put on a stinted allowance—not always of English hay nor of roots. In some instances the farmer will have accomplished his aim if the cattle survive the winter. Not to go more into detail—it is apparent, that as his husbandry is defective in its great principle, it must be defective throughout. His opinions and practice are derived from his ancestors. His own habits have given to them additional force. He may then unaffectedly wonder, that other methods should be thought preferable to those to which he is accustomed—and listen with indifference and distrust, to statements, which demonstratively shew, that his practices are erroneous and against his true interests. He may be an eye witness of the results of a neighbour's better directed labours—notice

the richer products of his improved soil—his finer breed of animals—and be led by his curiosity to examine the various implements employed by the scientific cultivator, and go away with the belief, that a plain and prudent farmer has nothing to learn, but should steadily pursue the beaten track of his ancestors. Should his better reason suggest the probable utility of a new experiment, the momentary impulse towards innovation is checked by rising fears. The disadvantages of his present condition, whatever they may be, have become familiar and are easily borne. The humblest of our species oppressed daily by the miseries of penury, may have the same consolation. There is no species of slavery worse than that which men impose upon themselves in yielding wholly to the guidance of custom and the narrow prejudices which it engenders.

It is a fundamental principle of good and profitable husbandry, that no more land should be laid out for cultivation than the farmer can till in the most skilful and thorough manner. Wherever there is a crowded population, the husbandman may be compelled to seek his subsistence within the limit of a few acres. The resources of art, which he must call to his aid, are alike open to all whether they possess more or less land—and whether they inhabit districts more or less populous—nor are these resources less valuable in the one case than the other; so far as respects the general treatment of the soil, and the great object of increasing its productiveness. If five acres under faithful management can be made to yield a subsistence for a family, shall we be permitted to say that a hundred of equal quality can do no more? If it be said that a refined and thorough cultivation involves an expense which absorbs the profit, let it be remembered, that the skilful farmer often not only obtains a comfortable support from the produce of a few acres, but is enabled from the surplus of his earnings to add progressively to his little territory, and to become opulent. It may be objected, that a result like this cannot be expected without a

preparatory acquisition of science—without much care and much reflection in the choice of means. But on what other terms is success to be expected in any other calling or pursuit? It is no answer to say, that the common operations of a rude husbandry are laborious, and that the farmer only adds to his burdens by permitting his attention to be occupied by whatever is new, that comes recommended as an improvement—he will learn how to make the same labour more productive—he will have the benefit of the experience of the most enlightened and wisest practical men, who cannot be supposed to have toiled in vain in their endeavours to improve the art of husbandry—nor to have had any other aim than to ascertain the means of procuring the greatest profit from their labour.

Farmers are over cautious in admitting innovations on their practice, and discover too much of a jealous reluctance to examine the documents by which the utility of these may be fully proved. No one doubts, that all the arts which contribute to the support and comfort of man in civilized life, have had their origin at different periods, and that at first they were not as perfect as we now find them, but that they have advanced step by step, through progressive stages. Nor will it be questioned that improvements now known to be valuable, have sometimes been long prepared and tendered to the acceptance of mankind before their merit has been admitted. Their authors may have perished with the reputation of visionary men—an ill-merited reputation, as unpropitious to the interests of society, as unjust to the individuals.

Who, looking back on the past, will hesitate to agree, that our posterity, will gather from the same fields five fold more than the present generation? And how is this to be accomplished—by what means? If we look to Europe—to England especially—we find there the necessary means in use. It is to be effected, not so much by an increase of labour, as by a more judicious application of it, with the aid of improved implements. In whatever res-

pects the husbandry of England is preferable to that of our own country—and there can be no doubt it is so in many—some future generation of our people, perhaps wiser than the present, will assuredly adopt these profitable methods of the English farmer. Why then should we now reject them? The reason in favour of receiving them at a future period by our posterity will be no other than may be urged for the adoption of them now—it is—that they are the result of careful and repeated experiment, and that their utility is established.

We are a highly privileged people, in as much as with all the rich resources of a new country, we may avail ourselves of the science and experience of the old world. Our yeomanry are proprietors of estates, which, under skilful management, would entitle them to rank with the wealthy in some parts of Europe. We enjoy a free intercourse with every portion of the world, whence any useful knowledge may be derived—and our husbandmen have not only capacity to judge, but opportunity to gain, whatever any other country can now offer to give variety to our culture, or improvement to our husbandry.

Considerations like these ought to check all unreasonable distrust of what is new. They furnish sufficient reason for keeping the mind open to conviction—and for training it to a habit of liberal inquiry. There is no question here of the truth of abstract speculations. But only how far, what has been found profitable to the inhabitants of other countries by experiment and long use, may be beneficial to us.

A reference to the history of agriculture in the land of our progenitors, will shew, that, as much as the farmers of that country now excel us in the art, at a period so late as that of the first settlement of the English in this country, our common roots and fruits were not cultivated in England—a small portion only of the land had been subjected to tillage,—numerous herds and flocks overran the territory—and almost the whole country presented nothing to the view but an

alternation of pasture and forest. A Baron of the realm, at the period alluded to, enjoyed fewer of the substantial comforts of life than a reputable farmer of the present day. Consider for a moment the advantage, which a knowledge of the potatoe, and the modern method of cultivating it, gives to the farmer of our times over a person in the same class in the reign of Henry the Eighth, of England. The produce of one acre of this root, carefully cultivated, will sustain, for the space of a year, ten persons. It would require but one faithful labourer to manage with proper care ten acres with a crop of the potatoe. Thus by his labour alone a hundred persons might be supplied with a sufficiency of food for the time mentioned.

If a half century ago it had been said that there remained to be known nothing which could be turned to profitable use in agriculture, there is no one here present that could not bear testimony to the absurdity of the assertion; nor would hesitate to say, that it was presumptuous, and against reason. Would it not be as absurd to speak thus of the future? Science is continually engaged in enriching this art—commerce is ever furnishing new materials for experiment. It not only transports the products of one country to another for consumption, but for propagation. It not only brings us from abroad vegetable productions before unknown, but the knowledge of their uses, and the methods of their cultivation.

For what, let me ask, are our times more distinguished, than for the zeal and success with which all science is applied to practical uses? The chemist, the mineralogist, the botanist and the mathematician, are fellow labourers with the practical farmer and the manufacturer. Vain and unprofitable theories no longer engross the attention of men of science. It can no longer be said, as formerly, that an active and feverish imagination is as distinguishing a mark of a philosopher as of a poet. Philosophers are, in our days, *business men*.

There are in almost all parts of Europe associations of distinguished persons, united not only for the purpose of encour-

raging the researches and rewarding the useful discoveries of genius, but for ushering such discoveries into the world under the sanction of their patronage, and for inviting and encouraging the public to avail of them. Societies for the same purposes, not inconsiderable in number, exist also in our own country.

Cultivators of the soil may confidently anticipate an enlargement of their resources, not only by the rapid improvement of the art, but by the multiplication of their products. New staples will find their way into New-England, as they have done, from time to time, elsewhere. Cotton, the great staple of the south, now worth forty millions a year to the United States, was not a native of the country. The grape, which yields the great staple of France, was not indigenous, nor was the olive in the south of Europe. Massachusetts, within a few years, has acquired an invaluable stock, in the Merino sheep. To those who know their intrinsic worth, it will not be thought presumptuous to say, that they will ere long yield us our most valuable staple. Whether we consider the abundance, the fineness, or the beauty of their fleece, they are, in all these respects, a gain to our country. The history of the prevailing prejudice against the animal, were it not too delicate a subject to touch upon, is too recent not to be generally known. The remembrance of the *Merino mania* will soon cease to bring up painful associations, and we shall be better disposed to believe, what is demonstrably true, that we are indebted to Spain for a great source of future wealth. After the *tulipo-mania*, or rage for tulips, had subsisted three years in Holland, from 1634, during which, it took entire possession of that sober people the Dutch, and engrossed in a single town a capital of four and a half millions of dollars, it subsided, and left the tulip to be, as it has ever since continued, the favorite flower of the Hollander. And may we not hope that the Merino sheep, possessing *so much more substantial merit*, will ere long become a universal favourite in Massachusetts?

Discoveries and inventions, the use and benefit of which are familiar, are not always duly valued, because we are not always aware how different would be our condition without them—would we bring distinctly to view, a state of society less improved than that of our own day, and the inconveniences attendant upon a less advanced stage of the useful arts, we should be more inclined to look forward with interest upon every prospect of new acquisitions to our stock of knowledge and means of enjoyment. We have seen how important a rank the modern farmer of England with his skill and resources would have held in the estimation of his countrymen, who had preceded him from two to three centuries. We must not forget that he deserves also to be considered as in advance of the husbandman of our own country. Were it not so, how could he subsist and support the heavy burdens, which the peculiar circumstances of his country have imposed upon him? Not less than half his income is absorbed by taxes—the great extension of the manufactures oblige him to pay dear for labour, and the average prices of the provision markets are not so great as those of our own. Under all these disadvantages he maintains his independence. He is enabled to do so by adopting improved labour-saving implements—by forcing the soil to its full capacity of bearing—by assiduous attention to the accumulating of manures—by proper measures to prevent their waste—and by a judicious application of them—by raising root crops, on an extensive scale, for his cattle—and by an admirable system of order, economy, and neatness, in every branch of husbandry.

In no country of Europe, we have said, are the same class of cultivators so amply endowed with lands as the husbandmen of Massachusetts. The burdens of our government are so light, that they are scarcely more felt than the weight of the atmosphere. The four millions of acres in Massachusetts would sustain a population from a million to a million and a half—and just in proportion as our products increase, there will rise up mouths to consume them.

Were the labours of the cultivators, or the large farms in Massachusetts, confined to such portions of land as their means would enable them to husband in a skilful and faithful manner, there can be no doubt that one third part of the land now employed in tillage would yield as great products as are obtained from the whole. It will be perceived that the farmer may thus increase the value of his farm three fold. The story of a Swiss farmer to the same point, although it may be thought more properly to belong to the pages of the Almanack, than to a discourse on an occasion like the present, I may be allowed to state in substance, as affording a good practical lesson. The person alluded to had portioned in succession three daughters, with a quarter part of his farm to each. As his territory thus diminished, he redoubled his efforts and employed additional art and care in his cultivation, and thus kept up his crops to the same aggregate amount each year, even when there remained to him only a fourth part of the land which he originally possessed.

As an agricultural, community, our progress in improvement cannot be great until the science of breeding and the art of keeping cattle is better understood—until we attach a broader signification to the word *manure*—that great aliment of agriculture, extending it so as to embrace a composition of earths and every species of vegetable refuse and animal offal, as well as the litter and dung of the stable—nor until ploughs and other implements are adopted superior to those now commonly used. It has been ascertained by an accurate instrument adapted to the purpose, that there is a difference in ploughs of the same size and weight, in regard to the power required for the draft, amounting to from *two to six hundred per cent.* It is doubted whether the knowledge of such a difference, or indeed of any, is known generally to our husbandmen or whether it has usually been considered in the purchase of the implement. Every farmer complains of the expense of labour. This discovery will ena-

ble him to dispense with half or perhaps two thirds of his team in one of the most laborious operations of the farm. It will not be out of place here to state, that in one of the northern counties of England, it had been the universal practice to plough with six horses, until, on the institution of a periodical ploughing match, the old ploughs were in a short time laid aside, and new ones on an improved construction substituted. It was soon found that two horses could accomplish the same work which with the ploughs before in use, it had required six horses to perform. How important is such a discovery to the farming interest!

At the present moment the prospect of an increase of his crops, in future years, may not appear to the farmers desirable. The great abundance of the harvest and the difficulty of obtaining a vent for his produce, fill him with despondence. But is it not true, that if he is compelled to sell cheap, he may buy proportionably cheap whatever he may have need of? Besides, the tendency of plenty is to encourage population, and manufactures, and thus to raise the value of land and to increase the permanent demand for the productions of agriculture. Besides, the farmer has a further resource in seasons of uncommon plenty, to prevent waste—that is, to increase his live stock.

But let us not confine ourselves to the consideration of the progress of agriculture as it may concern alone the prosperity of individuals. The individuals in a country may be rich, and the public at the same time be poor—if having nothing to eat may make a country poor—merchants and manufacturers may be opulent, but if agriculture is neglected, neither the one or the other may be able, in certain exigencies, to procure the necessaries of life. I state an extreme case, but it is no less true, that the substantial wealth of a country, which consists in abundance of food, depends on a flourishing state of agriculture. In a time of scarcity, long continued, whatever we call property would lose its value. Agriculture is not only an indispensable resource, as a means

of preserving in being those who now exist, it is no less important as a means of increasing the population of a country. Hitherto our growing numbers have been sustained rather by the clearing of new lands than by any great progressive improvement of the old. But setting apart but a moderate allowance of forest for the various purposes for which it is important, we must look to a better husbandry for the support of a much greater number of inhabitants.

We cannot be at a loss on what rest our surest hopes of public prosperity, when we consider how independent is agriculture of the hazards and reverses to which commerce and manufactures are exposed. "The ordinary revolutions of war and government," it has been truly said, "may dry up the sources of the wealth which arises from these, while that which arises from the solid improvements of agriculture is durable. The troubles of the fifteenth and sixteenth centuries greatly diminished the commerce of Lombardy and Tuscany. But those countries continued notwithstanding, and still continue, among the most populous and best cultivated parts of Europe. The civil wars in Flanders, and the Spanish domination which succeeded them, chased away the great commerce of Ghent and Antwerp, but Flanders is still rich, highly productive, and well peopled."*

The wealth of the merchant may be transferred from one country to another, but that of the land proprietor is as fixed as the earth. It is true, the face of a country may be swept by hostile armies, but it is only the harvest of a season which can fall within their destructive grasp; the productive power of the soil still remains unimpaired. But the wealth of the merchant may perish irretrievably by the conflagration of a city, or be sunk in the ocean.

However individuals may be affected, whether farmers or others, by the common vicissitudes of life, as respects the public, the improvements in agriculture are an imperishable and continually accumulating resource.

* Smith's Wealth of Nations.

But it by no means follows that, because agriculture ought not to be neglected, we may therefore turn away from commerce, as if, on the whole, the balance of its good and ill success were equal. It has done much to enrich individuals engaged in its pursuit, it has done more for agriculture. In those countries to which we have just alluded, as having enjoyed a productive commerce, which subsequently passed away, if their agriculture was, for a long time, unrivalled in Europe, it was that very commerce which nurtured it, and finally gave to it all its refinement.

As agriculturists we have fresh proofs every day of the beneficial operation of commerce on our interests. It takes our surplus produce to its best market. And this is not all—the surplus capital which it throws into the hands of the merchants, naturally tends to the soil as its ultimate destination. Here it finds its greatest security, and here it will be most permanently beneficial to the country. Most of our richest merchants are land proprietors, and to some among them, we are indebted for recent and valuable improvements in agriculture.

It were hardly possible at this time to allude in a public address either to agricultural or commercial interests, much less to treat of them as leading topics, without recalling to the mind of every one, the subject of the new *tariff*, which must again soon engage the attention of Congress. I refer particularly to those parts of it, which are professedly designed for the encouragement of domestic manufactures.

However often and ably the right of Congress to control private industry, and to give it a direction into new channels at discretion, may have been recently combated, it cannot be too often urged, that it is an unauthorised assumption of power. It may well be questioned whether any member of the Convention which framed the Constitution, to whatever extent his jealousy of the power to raise a revenue may have carried his apprehensions, ever conceived that it would be

used to convert a merchant into a manufacturer, at the pleasure of Congress—to compel the farmer to abandon the pursuits of husbandry for the spindle and shuttle—to foreclose the inclinations—the bent of genius, the temperament and tastes of men, and to designate their employments by the statute book. It is no answer to say, that no such power is claimed, and that the measure complained of will produce no such effects—the principle of the measure contemplates such a power, and involves such effects. If government may so burden and embarrass one branch of industry as to discourage the pursuit of it, avowing the purpose to be to build up another branch at the expense of the first, it has power to go on and curtail or annihilate any or all other branches. Should the company of tallow chandlers think proper to represent before Congress, that it would be for the interest of the nation to prohibit the importation of whale oil, by the imposition of a heavy duty, a concurrence of Congress in their views would be attended with this consequence—that not an American whale ship would be again seen on the ocean, at least none, whose cargoes should be destined for the supply of the home market—and the island of Nantucket might soon be deserted by its seven thousand industrious and thriving inhabitants. We see nothing in this case differing in principle from that of the cotton and woollen manufacturers, with the provisions in their favour contained in the new tariff, connected with the views of Congress in making these provisions.

Whatever supposition there may be of public good and national advantage in acts of legislation, by which the claim of one class of industry to the protection of government is declared subordinate to another, it must be ill founded. In general terms, no one will question that the citizen is entitled to the protection of government in his person and property, and that, if such protection means any thing, it is, that each one is to be protected in that *calling*, which he may elect. But upon the doctrine, that government may have its fa-

yourite class, whose interests it may cherish with an exclusive spirit, what becomes of the right to equal protection? In the case we are considering—the merchant enjoys it not—nor the farmer, nor the mechanic. Thus may we go on, and enumerate every denomination of persons in the community, until we come to the fearful result, that the Constitution is a dead letter—and that we have no other security for our rights than the discretionary forbearance of Congress to intermeddle with them.

The present distresses of Great Britain, growing out of a policy, similar to that on which our Government has entered, are known to all. A leading merchant of London, who is also a distinguished statesman,* has pointed out the course by which this accumulation of evil has been brought upon that country. "Whenever" says he, "the assistance of government is called for by any class of manufacturers or traders, it is usual to make the most splendid display of the importance of that particular branch to the nation at large. The West and East India interests, the ship owners, the manufacturers, and others, have all made their representations; but it should be recollected, that it is contrary to sound policy to advance one beyond its natural means, and still more so when that *must* be done at the expense of the others."

The reflection is a pleasant one, that while we are defending the interest of the farmer, so far from opposing that of the manufacturer, we are defending that also—because, after all, his interests will find their best security in his own enterprise, skill, and industry. His calculations on the partiality of government will prove fallacious. A policy, which condemns to a subordinate rank the interests of the great mass of the people, must be short-lived. Our manufactures are known to be in a thriving state—the whole country is proud of their success. The theories of mistaken political economists apart—a doubt may exist whether the manufacturers have any thing to urge in favour of the new duties. Their industry is

* Alexander Baring.

protected—they are honoured by the community—and the encouragements, which we are prepared to offer on this anniversary to the farmers of our Commonwealth, are to be extended equally to the manufacturers.

The merchant unembarrassed by prohibitory duties will need no stimulus but his own enterprise. The manufacturer will exhibit to us this day ample proofs that he can thrive without the further aid of the government. The farmer alone declines to avail himself of the means of prosperity. He has been too long accustomed to view himself in the light of a day labourer rather than as the professor of an honourable and lucrative art. The mysteries of husbandry are considered but as the lesson of a day—and every man, the moment he becomes the occupant of a farm, is allowed to style himself a competent farmer. “It fills me with astonishment,” said Columella, the Roman, “that while those, who wish to become orators, always have recourse to one as a teacher, whom they may take as a model—and those who learn music, dancing, or any other of the lighter and more frivolous accomplishments, employ, of course, a professed teacher; Agriculture, that most important of all arts, has neither masters to teach it, nor pupils who seek to be taught. Is there then nothing in it which requires to be studied?—Is there nothing to reward research? For myself,” he continues, “when I take an enlarged view of this noblest of all pursuits, and survey it on all sides—and consider what it embraces that it would be profitable to know, I fear that I shall see the end of my days before I shall become a thorough master of all its mysteries!”

And how melancholy, gentlemen, are some of the consequences of so great a neglect of agriculture amongst us! Of the sixty thousand individuals, who annually emigrate to the south and west from New-England, in search of subsistence, most of them may reach in safety the places of their destination. But if you follow them in imagination, into the wilderness, you will soon see that its morbid dampness and the nu-

merous privations and hardships, to which they are unavoidably exposed, soon finish the work of destruction, which a miserable agriculture had begun. The offspring of parents who possess at home a redundant territory, are compelled, for subsistence, to alienate themselves from their kindred, and to interpose a distance of a thousand or two thousand miles between themselves, and all they have valued from their infancy.

When we learn, that in a canton in one of the highest inhabited regions of the Alps, where neither nature nor art can sustain more than a small number of human beings, it has long been the custom for the young men, on attaining to a certain age, to enlist in the military service either of France or Spain, for a term of years, and that all who decline, remain not only without consideration among their countrymen, but are covered with obloquy, we acquiesce in the necessity of this harsh policy. But we have far other impressions of a course of things bearing a similar aspect in Massachusetts,—when the neglect of agriculture is the only assignable cause of no inconsiderable part of the emigration which takes place from year to year.

Were the modern improvements, (which have been tested,) allowed to spread themselves over the face of our country, and to fertilize our fields, much of the emigration would cease—manufactures would more extensively flourish, and obtain their only sure and permanent support, an abundant and cheap subsistence for the workmen.

But our agricultural societies are every where rising up, like so many temples of science, inviting our citizens to come and do homage to an art, which is prepared to open a fountain of wealth to gladden our whole country. The institution of shows of industry, is admirably adapted to draw our husbandmen away from the influence of injurious prejudices, and still more injurious habits, and to awaken a spirit of emulation and liberal inquiry. Until within a few years the hus-

bandman was known only as the vender of his produce—now, his skill and industry are expressly recognised as public benefits. He will no longer labour in the retirement of his fields, looking only to so humble a result of his toil, as that of a scanty harvest. No—he will have always in remembrance that a day is appointed, in each year, on which, in the face of the world, he may claim to be named as a benefactor to the public, on exhibiting proofs of uncommon diligence and proficiency in his art. He will come *here*—he will meet an assembled community, as eager to adjust his claims as he may be to urge them. They will enter with him into the field where the competition is held. Those, who from inexperience, or other cause, may be incompetent to weigh the merits of the competitors, will seek to inform themselves by inquiry of those more skilled. All will be ambitious of the honour of anticipating the decision of the judges.

The animated discussion, among the multitude, of topics of agriculture and the useful arts, will give a new interest to the various subjects—the zeal here inspired, and the knowledge obtained, will be carried home, and be soon seen in their effects like the invigorating power of a rich *compost*—and the solitude of the country will be relieved, not only by more ardent and better directed labours, but cheered by more exhilarating prospects.

With a power of influence such as this, what limit can we assign to the usefulness of our agricultural societies? The obligation upon them to use this power to its full extent, ought to be deeply impressed—nor should they remit their endeavours to make themselves acquainted with the improvements, which so liberal and so progressive an art may from time to time offer, whether they originate in our own, or in other countries. Nor is it less important, as a means of diffusing these throughout the State, that the Societies should seek to increase their funds, so that their power of bestowing premiums may be commensurate with the improvements they may think it important to recommend. The

time, we may hope, will arrive, when the smallest details of rural economy may become subjects of reward, as well as the leading operations of husbandry. I say the smallest details, because, in husbandry there is nothing which is unimportant or uninteresting. There is nothing so small as not to have, either in a moral or economical view, an influence on the well being of the farmer. There is nothing of so little consequence, that, if disregarded, its neglect will not be perceived to mar the harmony of that delightful picture—a well ordered, neat, and polished husbandry. How soon, we may impatiently ask, how soon shall we behold the day, when such a picture shall gladden our eyes, whichever way we turn them, in this land of precious privileges !

OFFICIAL REPORTS OF THE MASSACHUSETTS AGRICULTURAL SOCIETY, UPON THE SUBJECT OF THE CATTLE SHOW, EXHIBITION OF MANUFACTURES, PLOUGHING MATCH, AND AGRICULTURAL INVENTIONS FOR THE YEAR PAST--AS ANNOUNCED AT THEIR ANNIVERSARY HELD AT BRIGHTON ON THE SEVENTEENTH AND EIGHTEENTH DAYS OF OCTOBER, 1820.

FIRST REPORT.

REPORT of the committee appointed to award premiums on every description of *domestic animals* included in their list of premiums. This committee consisted of one member of the board of Trustees, and of four other gentlemen specially selected for their knowledge and experience in live stock—and not connected with the board of trustees; viz. Mr. Harrington, of Roxbury; Mr. White, of Watertown; Mr. Gates, of Dedham, and Mr. Perry, of Sherburne.

The chairman of this committee repeated *verbally* to the board, that the duties of that committee, owing to the en-

larged number of competitors for premiums, had been so much increased, that it was impossible for him to draw up a written report, but he endeavoured to state from memory the principles which had governed them in their decision. He would endeavour not to exaggerate the facts, while he should deem it a duty alike to do justice to the important influence which the society by its premiums had produced upon our agriculture, and to the spirit and intelligence, by which they had been seconded and supported by the intelligent cultivators of the state. It is scarcely possible that any man could have the hardihood to misrepresent the state of improvement as to an exhibition which is so *open to all the world*. Every spectator was a self constituted judge, and would instantly condemn any attempt at misrepresentation. The effect of this show, on the character and qualities of our domestic animals, was so marked and so unquestionable, that a man who had viewed the exhibition in its infancy four years since, could scarcely believe that he was in the same society and surrounded by the same cultivators, who assembled and brought their best productions at that period. The race of hogs was so entirely changed and improved, that one could with difficulty recognize a feature of the tall, raw-boned, thick-legged race which had for so many years been the disgrace, while they had consumed the profits, of the farmer of Massachusetts. The same remark applied with still greater force to the exhibition of fat cattle. The society having announced that their premiums should no longer be given to monstrous and overgrown animals—that *mere weight alone* should cease to be the criterion, but that adopting the rules of the inimitable Bakewell, whose name ought to be placed by the side of Olivier de Serres the great farmer of France, and of Evelyn who gained so much glory in Great Britain as a practical cultivator, they should hereafter award their premiums to the animals which presented the finest forms and discovered the greatest dis-

position or aptitude to acquire flesh with the smallest possible expense.

It is surely a proof, if any thing of this sort is susceptible of proof, that the effects of this society and its shows, have been productive of great benefit to the state; that instead of two or three, we had this year no less than fourteen fat oxen, the great part of which were beautiful in their forms, and whose average weight exceeded two thousand pounds. The particulars we shall state when we come to the specific awards and premiums.

The same degree and indeed a superior degree of advancement and progress in domestic animals, was observable in the *full grown* bulls, as distinguished from bull calves.

Here we cannot but congratulate the well wishers to the prosperity of this *grazing State* on the enterprise, patriotism and public spirit which have introduced the improved races of Great Britain. There were, and there probably are yet individuals who think the money expended by our society for *this* object a *waste*.

But how illiberal is this prejudice. It is not more than half a century since the farmers of England, with immense wealth, and not valuing the price of 5000 dollars for an extraordinary bull calf, began to ameliorate *their* stock. There is no doubt we had as good in our *own* country—but who seeks them out? Who arrested by a liberal price, the knife of the butcher about to sacrifice an extraordinary animal, who if preserved would essentially improve our breed? No one—until the agricultural societies turned their attention to it. A bull in Great Britain fifty years since had a standard price—No man would pay more for *one* bull than *another*.—But Bakewell and Princeps and other liberal farmers adopted the principle of amelioration, and soon they were rewarded not only by public distinction, but by pecuniary gain; and an animal that could before be bought without discrimination from any dairy full grown at 50 dollars, often at six months old brought from 4000 to 6000 dollars. Nor was

this the effect of any ridiculous passion, like our prices for merino rams. It sustained itself for 20 years, and yet continues to exist in that nation—a proof and the best proof of the soundness of the opinion on which these preferences were founded.

It is happy for the Massachusetts farmers that the Massachusetts Agricultural Society did not embark *earlier* in the encouragement of these *foreign* animals. We permitted the rage to vent itself in Great Britain before we began—and we had the advantage of knowing *what* breed, after *twenty years* trial, English farmers had found *most productive*. On the whole, it seemed that the general opinion was in favour of the *short horned animals*—the long horned one, (our old *native* race) being too large and raw boned for profit.—The Holderness, and the Teeswater, being a variety of the short-horned breed, were preferred.

It is a great pleasure to us to announce that our premiums and encouragement have induced Mr. Williams of Northborough to introduce a pure Teeswater bull—Mr. Parsons, a Holderness, and Mr. Coolidge his admirable bull Cœlebs of the same race, though he may be from a different, but most certainly an equally good stock. Now we venture to appeal to any persons who did the *society and themselves the honour* of visiting our Show, whether the public did not in these instances in *every case* anticipate our decision? It was scarcely possible to keep off the throng from the pens in which these superior animals were shown. We ought not to omit the introduction of the Flanders breed, by Col. Thorndike, a stock which, if we can judge either from their reputation in Europe, or the present promise of the progeny here, may prove little if any inferior for the dairy to the best races of England. But suppose we *do not* succeed by these importations—we have the satisfaction of having made great and laudable efforts, and we shall assuredly excite our farmers to strive to equal these *boasted* races of *foreign* growth. The greatest benefits we have ever hoped to derive were, that we should select, and save from indiscriminate slaughter, the

finest of our *own* stock, while we should gradually improve it by crosses with the *best* animals of *foreign* countries.

There can be no stronger proof of the benefits we have already derived, than the fact, that the *progeny* of the foreign races are by the public as well as the committee, preferred to those of our native breeds.

One remark more we beg leave to make before we announce the prizes awarded on Stock.—It is not possible for any body of men to take *more efficient* measures to secure impartiality than the Trustees of this Society have done. We have never more than *one* Trustee on any *one* committee, and the majority are strangers. On this great object and first design of the show, domestic animals, we have four strangers to one Trustee, and that one was never a competitor for *any* prize.

The prizes awarded were as follows—we publish them at large, because we think the just praise for successful exertions, far more exciting and valuable than the prizes *themselves*.

For the best Bull, to *Comet*, owned by Cornelius Coolidge, Esq. of Dorchester, the progeny of his excellent imported Bull Cœlebs, but raised with great care by Mr. Jaques of Charlestown—the first prize of forty dollars.

For the next best Bull, a *Native* one—Payson Williams of Fitchburg, 25 dollars.

For the best Bull Calf, not less than five or more than twelve months old, to Moses Coolidge, Esq. of Watertown, progeny of Cœlebs, imported by his son, 15 dollars.

For the next best Bull Calf, to John Barker of Leominster, 8 dollars.

For the best Milch Cow, not less than three years old, to Nathan Sanderson of Waltham, which made 13½ pounds of butter per week on an average, 40 dollars.

For the next best to Asa Wheeler of East Sudbury, 50 dollars.

For the third best do. to Mr. Samuel Dudley of Brighton, 20 dollars.

For the best Ox, fitted for slaughter, to Josiah Morton, of Hatfield, 50 dollars—weight of the Ox 2578.

For the next best do. Henry Chapin son of Col. Chapin, the owner of the famous Oxen, Magnus and Maximus, 30 dollars—weight 2149.

For the next best do. Lewis Barnard, 30 dollars—weight 2173.

For the best Merino Wether, Nathaniel Ingersoll, Esq. Brookline, 20 dollars.

For the next best do. Gen. Nathaniel Austin of Charlestown, 10 dollars.

For the best Merino Ram, Nathaniel Ingersoll, Esq. Brookline, 20 dollars.

For the next best do. Benjamin Savery, Byfield, 10 dollars.

For the best Merino Ewe, Nathaniel Ingersoll, Esq. of Brookline, 30 dollars.

For the next best do. Benjamin Savery, Byfield, 15 dollars.

For the best Boar, to Dr. Francis Moore of Brighton, *imported* breed, and crossed with the Byfield, 5 dollars.

For the best Sow, to Samuel Tewksbury, Chelsea, 10 dollars.

For the next best do. Capt Orange Wright, Northampton. 5 dollars.

For the best store Pigs, to Francis Winship, Esq. of Brighton, 10 dollars—chiefly imported breed.

For the next best do. Isaac Davenport, Esq. of Milton, 5 dollars.

For the best Heifer under 3 years, Mark Vose, Watertown, 15 dollars.

For the next best do. Amos Russell, Deerfield.

These are all our premiums on Stock, but it must occur to every liberal minded man, that it is impossible in this

branch to do exact justice to all, where we have *ten* competitors for *one* premium.

It must be after all only an *approximation* to justice, and illiberal must that *man* be, and *small* must be his regard for the *public* good, who quarrels with a decision, because another man's animal is preferred to his own. He ought rather to rejoice because he finds *himself* *outdone*. We know this is not human nature, because human nature is imperfect, and for this reason we shall notice those which, though they did *not* receive, yet in many states would have had a premium, and who *deserved* one *here* had we more money to give, or a smaller number of excellent animals entered for premiums.

Bulls.—That of Mr. Wheeler of Framingham, from Fill Pail, (Mr. Thorndike's Bull) was entitled to great notice, but he had the premium last year; Mr. Prince's of Roxbury, also from Fill Pail, was a noble animal; Mr. Parker's of Chelmsford, and Mr. Leland's of Sherburne, also attracted the attention of the committee.

Of the Bull Calves.—That presented by Hervey Stone; from Mr. Parson's Holderness; that of the Rev. John Codman, from the same stock; Peter Clark's of Watertown, and Oliver Locke's of Lexington, were all of them such as we seldom see in our country in Cattle Shows.

Of the Cows.—That of the Hon. Mr. Welles of Dorchester, divided the suffrages of the committee. Indeed his whole stock did great honour to the country and to his exertions and care. Isaac Howe of Dorchester, exhibited a fine Cow, as did John Rand of Weston. Thomas Williams, Esq. of Roxbury, manifested his zeal for the promotion of our objects, by exhibiting a fine race of animals from the stock imported by Charles Vaughan, Esq. of the same race from which descended the great Chapin Oxen.

Fat Oxen.—John English of Newton, exhibited an Ox, weight 2076; Dr. Isaac Hurd of Concord, a beautiful one, not weighed; Francis Richardson of Billerica, an Ox weigh-

ing 2103; John Richards, Esq. of Newton, 2 Oxen, joint weight 4301; Mr. Chapin to whom the second prize was given, 3 Oxen weighing over 2000 pounds each; John Rich of Sutton, a beautiful pair, weighing jointly 3964.

Heifers.—The most distinguished were Hervey Stone's by Fill Pail and from a Holderness Cow, John Richardson, Esq. by Fill Pail; John Prince, Esq.; a fine display of Fill Pail's progeny by Mr. Pomeroy, and Dr. Chaplin of Cambridge.

Boars, which were thought fine.—Mr. Tewksbury's and Mr. Wright's; both of whom obtained premiums for Sows.

Sows.—There never was so perfect an animal exhibited at our Shows of the race of Hogs as Mr. Prince's Sow, (not offered for premium,) of the most improved British race. It must be seen that as to *local* feelings, we have *had none*, having distributed prizes over the whole State, except the Southern district, who never send us samples.

JOHN LOWELL, *Chairman.*

SECOND REPORT.

THE Committee on Manufactures, viz :—RICHARD SULLIVAN, Chairman, Abbot Lawrence and John Lemist, adjudged the Premiums, as follows :—

For Broadcloths—To the Watertown Manufacturing Company, the first premium, 30 dollars.

To the Bellingham Manufacturing Company, the second premium, 20 dollars.

For Household Woollen Cloth—To Jonas Pollard of Bolton, the first premium, 12 dollars.

To Payson Williams of Fitchburg, the second premium, 8 dollars.

Cassimeres—To the Walcott Woollen Manufacturing Company, the first premium, 15 dollars.

To Richard Crowninshield, the second premium, 10 dollars.

Sattinets—To the Walcott Woollen Manufacturing Company, the first premium, 10 dollars.

To Daniel Ellis & Son of Walpole, the second premium, 6 dollars.

Cotton Cloth—To the Waltham Factory, the premium of 20 dollars.

To Thomas Hart, for fine Shirting Household Manufacture, a premium of 20 dollars.

For Fine Flannel—To James Howarth, Jr. & Co. Andover, the first premium, 10 dollars paid.

For Blankets—To Lewis Glazier of Gardner, county of Worcester, first premium, 6 dollars.

Carpeting—To Nathan Barrett of Concord, the first premium, 15 dollars.

To Sarah Livermore of Cambridgeport, the second premium, 7 dollars.

Worsted Hose—To William Phillips of Dedham, the first premium, 5 dollars.

Quarto Post Letter Paper—To David Ames of Springfield, the premium of 10 dollars.

Foolscap Writing Paper—To William Parker of Pepperell, the premium of 10 dollars.

Calf Skins—Francis Dana of Roxbury, the first premium, 10 dollars.

To Samuel Hobbs of Weston, the second premium, 5 dollars.

Sole Leather—To John Bartlett of Roxbury, the first premium, 10 dollars.

Cheese—To Ebenezer Tidd of New Braintree, the first premium, 10 dollars.

To Elisha Matthews of New Braintree, the second premium, 5 dollars.

Butter—To Luke Bemis of Watertown, the first premium, 10 dollars.

To Nahum Hardy of Waltham, the second premium, 5 dollars.

To Mary Noyes, for Butter, 5 dollars.

Wheat Flour.—To Payson Williams of Fitchburg, the premium of 25 dollars.

The Trustees at former exhibitions, being aware how difficult a task it would be to anticipate in their list of premiums, the multiplied forms in which the ingenuity and taste of our manufacturers might display themselves, allowed to the Committee on Manufactures a discretion in awarding premiums, to a small amount, when, in their opinion, the interest of the public might be promoted by this sort of notice. The Committee, therefore, availing themselves of the precedent of past years, recommended the following gratuities :—

To Sophia M. and Sarah-Ann Tileston, of Boston, for a superb Hearth Rug, 5 dollars.

To Chapin Allen, for Table-Cloths, unbleached, 5 dollars.

To the Boston Hat Manufacturing Company, 20 dollars.

To Israel Trask, of Beverly, for Britannia Metal Ware, 3 dollars.

For Ticking.—To James Watson, of Attleboro', 3 dollars.

To Ebenezer Blake, of Wrentham, for Straw Bonnets, 10 dollars.

To Johnson Mason, of Medfield, for do. 8 dollars.

To Miss Prentiss, of Petersham, for do. 5 dollars.

To Mary Rayman, of Salem, for do. 4 dollars.

To Betsey Bennet, of Framingham, for do. 5 dollars.

To Benjamin Wheeler, for do. 5 dollars.

To Lewis Glazier, for a Counterpane, 4 dollars.

To Mrs. Aaron Willard of Roxbury for a Counterpane, 5 dollars.

To Mrs. Susan Adams of Concord for an assortment of Plumes made of Turkey Down, 5 dollars.

To Misses Hannah, Polly and Catherine Lewis, for Bonnets and Tippetts of Turkey Down, each 2 dollars.

To Harriet Clapp of Boston, for a Down Tippet, 2 dollars.

To Miss Yvonett of Boston for a Cap, 2 dollars.

The specimens of Thread Lace were superior in the opinion of the Committee to those exhibited last year—They were of great beauty. The manufacture is increasing and receiving sufficient encouragement by the demand, to progress rapidly.

A variety of articles were offered for inspection which did great credit to the skill and ingenuity of the persons by whom they were wrought, but the Committee have not found sufficient time to enumerate them. An elegant Time Piece the workmanship of Mr. Curtis of Concord, is deserving of particular mention.

The Committee were gratified in observing a great improvement in the Broadcloths since the exhibition of the last year.

The Cotton goods were of a very superior quality. Those of the Waltham Factory were thought equal to any of the same class, which those of the Committee, conversant with this kind of manufacture, had ever seen.

The Cotton Shirtings of Mr. Hart and those of Mr. Benedick, of household manufacture were of a very fine quality and uncommonly good fabrick. Those of Mr. Benedick would have been entitled to a premium had there been five pieces—there were only four entered.

The Cassimeres of the Wolcott Woollen Factory were of an excellent fabrick and well finished and far better than any exhibited in former years. The Sattinets were equal to any ever imported.

The Flannel to which a premium was awarded, was remarked as being of a better quality than any of American manufacture which the Committee had ever before seen.

The Blankets for which a premium was given, were fine and soft, and of as strong a fabric as can be made of the short wool of the country. The committee beg leave to suggest

in conclusion, that the Blankets of the home manufacture can never be of a firm and durable quality, until the sheep which yields the long staple wool is introduced from Europe.

The Committee have recommended large gratuities for the Bonnets manufactured from the Rye Straw and from Grass, in imitation of the Leghorn Bonnets, because this article always comes to us from abroad charged at very high prices. The present exhibition has placed it beyond doubt that Bonnets equal to the Leghorns of a medium quality, can be manufactured in this country. There were a number of specimens of this quality exhibited, which were made in families, the manufacture will probably increase rapidly and supersede the necessity of further importation.

RICHARD SULLIVAN, *Chairman.*

Brighton, Oct. 18th, 1820.

THIRD REPORT.

THE committee on the Ploughing Match, viz: S. W. POMEROY, one of the Board of Trustees, *Benjamin Goddard* of Brookline and *Paul Upton* of Salem, reported as follows.

That a green sward 28 rods in length, was divided into sections of one quarter of an acre, which the Competitors were directed to plough not less than five inches in depth.

That five Competitors entered and took their sections by lot, viz:—

Lot No. 1.—Samuel Ward of Roxbury, finished in 47 minutes, furrows turned 20—one yoke of Oxen Ploughman and Driver.

No. 2.—Gorham Parsons of Brighton, finished in 41 minutes, furrows turned 20—one yoke of Oxen no Driver.

No. 3.—Silas Dudley of Sutton, finished in 38 minutes, furrows turned 20—one yoke of Oxen, no Driver, himself Ploughman.

No. 4.—Luke Fisk of Waltham, finished in 46 minutes, furrows turned 18—one yoke of Oxen, Ploughman and Driver.

No. 5.—Thomas Whitcombe of Lexington, finished in 38 minutes, furrows turned 20—two yoke of Oxen, Ploughman D. Pollard and himself Driver.

The Committee awarded as follows, viz :—

1st Premium to Gorham Parsons, Plough, \$ 20

Ploughman, Hervey Stone, - 10

Do. (no Driver.) - - 5

—\$35

2d Premium to Samuel Ward, Plough, \$12

Ploughman, Thomas Perkins, - 6

Driver, Wm. Ward, (a Lad,) - 3

—\$21

3d Premium to Luke Fisk, Plough, \$8

Himself Ploughman, - - 4

Driver, Jonas Bemis, - - 2

—\$14—70

Your Committee have to remark, that the Teams appeared to be well trained and in fine condition, and it was gratifying to observe, in Mr. *Dudley*, a competitor from the County of *Worcester* ; who may probably attribute his failure of success to an ordinary plough, and being less attentive to the execution of his work, than to the display of the power and agility of his Oxen, which were much admired. Though “*small in size*,” compared with others on the field, they were certainly “*great in value*,” and tended to confirm the opinion, that the county justly styled the *heart of the Commonwealth*, may boast of possessing a race of Working Cattle not surpassed in any country.

The unfavourable weather prevented the committee from testing, by the *Dynanometer*, the comparative resistance of the several Ploughs ; and they regret that there were not in competition any of *Wood's* or *Freeborn's* Cast Iron Ploughs, which appear to be gaining celebrity.

The attention of the committee was attracted by the exhibition of a Plough presented to Gorham Parsons, Esq. by the Hon. Philip J. Schuyler of Rhinebeck, New York, and made by Thomas Burden of Utica, in that state, resembling in its general form and structure, the SMALL SCOTCH Plough; and though not entered for the Ploughing Match, yet, from the little resistance apparently encountered in its work, they are impelled by a sense of the important improvements of which the *main pillar of husbandry* is susceptible, to deviate from the strict line of duty assigned them, and offer their opinion, that this Plough merits further trial and more particular examination.

But it is to be hoped that the MECHANICIANS of *Massachusetts*, who have so clearly demonstrated their capacity to improve upon the complicated Machines of the most celebrated European Artists, will direct their attention to this long neglected simple implement; for they must be aware, that the INCLINED PLANE and the SCREW, with MECHANICAL SCIENCE, are as applicable to the Plough, as they are dependent upon it for motion and support.

S. W. POMEROY, *Chairman*.

Brighton, Oct. 18, 1820.

N. B. The committee recommended to the notice of the Trustees, Henry Burrick, a Yorkshire Ploughman, for his skill and voluntary services in the management of Burden's Plough—in consideration of which, and of his commendable conduct with Mr. Derby's Scotch Plough at the last year's Ploughing Match, they granted him a further gratuity of five dollars.

FOURTH REPORT.

THE Committee on Working Oxen report:—That they have attended to the duty of examining the strength, docility, form, match and general power of the Cattle presented to them for premium.

The number of Cattle were *nine* yoke of Working Oxen. After as attentive a comparison as your committee were capable of, they awarded as follows :—

To Benjamin Woodbury, of Sutton, 1st premium, paid,	-	-	\$30
To Leonard Smith, of Waltham, 2d,	-	-	25
To John Rich, of Sutton, 3d, paid,	-	-	20
To Silas Dudley, of Sutton, 4th, paid,	-	-	15
To Luke Fiske of Waltham, 5th, paid,	-	-	10

The committee cannot fail to express their regret and surprise that, whilst these so liberal premiums are offered by the Society, there should yet be so few in number of well trained cattle. It is to be hoped that more perfection in training, particularly with a waggon, will be attained by our farmers.—The backing is an important and indispensable qualification to form a good team. Whilst our show exhibits a fine specimen of the breed and power of our cattle, how much is it to be regretted, that the instruction and training, of which our farmers are so capable, should be omitted; and thus, through mere inattention, fail in that imposing and grand effect of which this noble animal is so susceptible.

Your committee feel it a duty thus to appeal to the capacity and intelligence of our husbandmen, with a confidence that a substantial benefit may and will be derived from this most desirable attention. It will not be allowed to be said, that every thing improves as to our stock, but our care, our training, and our estimation of its utility. All which is submitted.

JOHN WELLES, *Chairman, per order.*

FIFTH REPORT.

The Committee on the subject of Inventions, Report:

That no machine was presented for their examination for which any specific premium was offered by the Trustees—so that if any be granted for any of those which have been entered for premium, it must be under the head of “an agricultural implement of an invention, which shall in the opinion of the Trustees deserve a reward.”

The first of this description, which came under the examination of your committee, was a hominy mill, presented by the Hon. Nathan Read, accompanied by a certificate of R. Manning and company, that it had been used at their livery stable; that it cracked corn with great facility, and answers the purpose perfectly. It is a cylinder, with steel teeth, moving over a concave cylinder with similar teeth—this last being movable, so as to regulate the fineness and coarseness of the meal. It is also provided with a feeding roller, which regulates the quantity of corn fed. It ground a peck of yellow Massachusetts corn in four minutes. The meal made measured one peck and two quarts. The whole was perfectly cracked. It appeared to your committee to be simple in its construction, and not likely to get out of order. The price at which it would be afforded was stated to be thirty-five dollars. Your committee deem it an invention likely to be useful to the agricultural interest, and recommend a premium of twenty dollars should be granted by the society.

A corn-sheller was entered for premium by Reuben Moore, which was a cylinder with iron teeth, moving over a concave semi-cylinder, with iron teeth. It performed the work of shelling a peck in a minute. It is in the opinion of your committee a useful machine. But as it in no material part differs, as far as they could perceive, from machines, used for a similar purpose, in this vicinity for many years past, they do not deem it entitled to any premium.

A corn-sheller was also entered for premium by Joshua Melville—like the last, it was a cylinder with iron teeth, moving over a semicircular cylinder, also provided with iron teeth. But it differed from the preceding in this, that the concave cylinder was moveable, and provided with a spring, which enabled the machine to shell equally, corn of every size. This last your committee deem a new invention, and of some importance to the old concave cylinder, enabling the work to be done more easily and faithfully. It shelled a peck in fifty seconds. The cost of the machine was stated to be eighteen dollars. The application of the spring to the concave cylinder would entitle it to some notice from the trustees, were it not the decided opinion of your committee that the vertical cast iron corn-sheller which was exhibited the last year and patented in New York, the cost of which does not materially differ from that under consideration, and which is now used and decidedly approved by several gentlemen in this vicinity, is a better instrument. And although your committee are anxious to encourage every species of agricultural invention, yet they deem it a rule, not only that the machine offered should be an improvement in itself, but that upon the whole it should be better than any machine for the same purpose, usually known and approved. On this account they cannot recommend any premium in this case.

A straw-cutter was presented for premium by Mr. Giles Dayton, Jr. which being patented, and the specification minute and embracing many particulars, your committee forbear to enumerate the particulars on which its claim as an invention depends. Its operation in the presence of your committee was to cut one bushel of chaff in a minute, with great regularity. It is cheap, the expense being only ten dollars; simple, and not easily put out of order. Considering all the circumstances connected with this machine, your committee recommend that the proprietor receive a premium of ten dollars.

A plough for paring meadows was presented for premium by Mr. John Guild. It is the application of a triangular iron of a breast paring hoe to a plough beam, provided with a cutting-knife. The machine is simple, and unquestionably useful, in removing the sward of meadows—cutting up cranberry vines, and producing an even surface; of which Mr. Guild produced a certificate of Mr. Greenough, who had seen the machine and its effect. Considering the nature of the invention, your committee recommend it as worthy the notice of the Trustees, and that he receive a premium of ten dollars.

A pistol with seven barrels, so constructed as to discharge seven balls successively with once loading and priming, was presented by Mr. Artemas Wheeler. Your committee saw its effect, which was conformable to the statement of the inventor, and was also deemed by military gentlemen present, an invention which would be useful in the naval service, as a boarding pistol. Your committee do not deem themselves authorised, notwithstanding the ingenuity displayed in its construction, to recommend any premium, it not being an instrument of use in agriculture; and having no certificate of its having been used and approved by a practical farmer!

A machine, called a double forcing pump, was presented for the examination of your committee, by Mr. Thomas Kilvert. It however not having been entered according to the requisitions of the trustees, and no certificate of its use or approbation by practical men being produced, your committee have not deemed it their duty to report more particularly on its operations.

A machine called a *flax seed separator* was sent by Mr. Elihu Hotchkiss, of Vermont, accompanied by various certificates. But no person was present either to explain its operation, nor had your committee any opportunity of testing by actual experiment, its power. Your committee therefore waived all decision on the subject, although their general impressions were favourable to its utility.

Your committee have seen with great satisfaction an increase in the number of inventions offered for premium. They regret however that there has been so little attention paid to the rules prescribed by the Trustees, and that certificates of practical operation have been so few. In distributing the public patronage, with which the Trustees are entrusted, it is essential in the case of inventions, that the committee charged with that subject, to be satisfied not only that what is offered is actually an invention, but also that it has been approved by practical men in their common course of business, and that it is not only an improvement, but also that the machine offered is better than any in common use. An attention to principles of this kind, at once so plain and so just, will tend to impress upon the minds of inventors the necessity of coming furnished with the proof of practical effect, required by the trustees; and also relieve the committee from the painful necessity of rejecting applications for useful improvements on the ground that better machines on the whole, are already in the possession of the public.

By order of the committee,

JOSIAH QUINCY, *Chairman.*

SIXTH REPORT.

THE Committee appointed to consider the claims for premiums on Agricultural Experiments, report :—

That Mr. Solomon Warner, of Northampton, in the County of Hampshire, is entitled to the Society's premium of thirty dollars, for a Crop of Winter Wheat, being thirty-two bushels and two quarts, raised on one acre of land.

That the Hon. Jonathan Hunnewell, of Boston, in the County of Suffolk, is entitled to the Society's premium of thirty dollars, for a Crop of Indian Corn, being two hundred and twenty-two bushels and one half of a bushel, measured

in the ears; equal to one hundred and eleven bushels and one peck of shelled corn, raised on one acre of his farm in Newton, in the County of Middlesex.

That the Hon. Oliver Fiske, of Worcester, in the County of Worcester, is entitled to the Society's premium of thirty dollars, "for the most satisfactory experiment to ascertain the best mode of raising Indian Corn, in hills, or in rows;" it will be seen by the certificates accompanying this report, that, from one half of an acre of land planted in rows, the produce was twenty-eight and one half double bushels of Corn in the ears; the same quantity of land planted in hills produced only twenty-three and one half double bushels;—the entire produce of the acre being equal to fifty-two bushels of shelled corn.

That Payson Williams, Esq. of Fitchburg, in the County of Worcester, is entitled to the Society's premium of twenty dollars, for a crop of Potatoes, being six hundred and fourteen bushels, raised on one acre of land.

That John Prince, Esq. of Roxbury, in the County of Norfolk, is entitled to the Society's premium of twenty dollars, for a crop of Mangel Wurtzel, being six hundred and seventy bushels and one half bushel, raised on one acre of land.

That Mr. Francis Winship, of Brighton, in the County of Middlesex, is entitled to the Society's premium of twenty dollars, for a crop of Cabbages, being thirty-two tons and two hundred weight, raised on one acre of land.

That Mr. Ebenezer Thrasher, of Salem, in the County of Essex, is entitled to the Society's premium of twenty dollars, for a crop of Carrots, weighing, exclusive of their tops, twenty-one tons, four hundred and one half hundred, equal to eight hundred and forty-nine bushels of fifty-six pounds each, raised on one acre of land. And the said Ebenezer Thrasher, is also entitled to the premium of twenty dollars, for a crop of Beets, being three hundred and twenty-three barrels, weighing, exclusive of their tops, nineteen tons, fifteen hun-

dred and eleven pounds, equal to seven hundred and ninety bushels, of fifty-six pounds each, raised on the same quantity of land.

The Hon. Samuel Dana, of Groton, in the County of Middlesex, as competitor for the premium offered by the Trustees, for the best crop of common Turnips. Mr. Asa Stebbins, jun. of Deerfield, in the County of Franklin ; Mr. Nathaniel S. Bennett, of Framingham, in the County of Middlesex ; and Mr. J. S. Low, of Andover, in the County of Essex, for the best crop of Indian Corn ; severally caused their names to be entered, but did not furnish the Committee with the evidence prescribed by the rules of the Trustees.

No claims for premiums were exhibited to the Committee, for introducing a Grass superior to any now cultivated in this State—for turning in green crops as a manure, and proving its utility and cheapness over any other manure—nor for proving by actual experiment, the best season and mode of laying down lands to grass, whether spring, summer, or fall seeding be preferable, and with or without grain on different soils.

The Committee are much gratified in having it in their power to state to the Board the following information, which has been communicated to them from the most unquestionable sources, to wit : That Mr. Hervey Stone raised the last season, on one acre of the farm of Gorham Parsons, Esq. in Brighton, twenty-two and one half bushels of spring wheat. Ezekiel Hersey Derby, Esq. of Salem, raised on three quarters of an acre, seven hundred and twenty bushels of Carrots, exclusive of their tops, which were estimated by competent judges to weigh five tons.

Mr. Gardiner Whiting, of Charlestown, raised on one acre of land, on Bunker Hill, forty-eight bushels and four quarts of Rye. Mr. Aaron Capin, of Dorchester, raised on four acres, three quarters and twenty-six rods, fourteen tons and sixteen hundred weight of Hay, equal to about three tons to the acre, leaving on the same land grass sufficient, in

the opinions of several respectable Farmers, to make two tons of Hay, "which could not be mowed on account of its being badly lodged." Mr. Dennis Stebbins, of Deerfield, raised five hundred and thirteen bushels of Potatoes, on one acre of land. And Mr. Tristram Little, of Newbury, raised on five eighths of an acre, four hundred and twenty bushels of common Turnips.

By order of the Committee,

THOMAS L. WINTHROP, *Chairman.*

Boston, December 21, 1820.

I Solomon Warner, of Northampton, in the County of Hampshire, do testify and say, that in the spring of 1819, I cleared a piece of wood-land, about three acres, and after the summer harvest succeeding, I ploughed it three times, and prepared it for a wheat crop. I prepared the seed-wheat by soaking it three days in a salt pickle, as strong as I could make it. I then drained the seed and rolled it in slacked lime. I put one and a half bushels of seed on each acre. No manure was made use of, and no other cultivation pursued. The labour on each acre in ploughing and getting in the seed was three days work with two hands and one team of a single yoke of oxen. I reaped the crop in August, and I caused one acre of the piece to be carefully marked off and measured by Mr. Curtis, a sworn surveyor. The crop from that acre was harvested by itself, and put into my barn, on a separate scaffold, where no other grain was put. In November of the present year, the grain from the aforesaid admeasured acre was thrashed, and carefully measured in a half bushel. It measured thirty-two bushels and two quarts. The land was rocky and the growth of timber, oak, chesnut, and walnut, and was virgin land never before cultivated.

And further the deponent saith not.

SOLOMON WARNER.

I Joshua Curtis of Northampton, of lawful age, testify and say, that I am a sworn surveyor of land, that I measured the land of Mr. Solomon Warner, on which he raised his wheat the past year, which he offers for premium. That the plot measured precisely one acre, and lay on the North-west corner of the field. And further saith not.

JOSHUA CURTIS.

I Abisha Williams, of Williamsburgh, of lawful age, testify and say, that I assisted in reaping and carting the wheat raised on the acre mentioned in the preceding certificate of Mr. Curtis, and deposited it by itself on the west scaffold of the said Solomon's barn. And further saith not.

ABISHA WILLIAMS.

We, Paul Warner, of Williamsburgh, and David Ring, of Chesterfield, both of lawful age, testify and say, that we threshed and measured the wheat lying on the west scaffold of Mr. Warner's barn, mentioned in the preceding affidavits, and the measure was thirty-two bushels and two quarts.

PAUL WARNER.

DAVID RING.

Hampshire, ss. 22d November, 1820.—Solomon Warner, Joshua Curtis, Abisha Williams, Paul Warner, and David King, personally appeared and severally made oath to the truth of the foregoing affidavits, by them respectively subscribed.

Before me,

JONATHAN LYMAN, *Justice of the Peace.*

[To the Trustees of the Massachusetts Agricultural Society.]

THE following is the statement of the production of one acre of land cultivated by me on my farm at Newton, in the year 1819, and also 1820. Previous to the year 1819, this land had been used as pasture ground for nearly thirty years. In the fall of 1818, this ground was ploughed for the first time since my remembrance. In the spring of 1819, it was again well ploughed and planted with corn in hills, in the common form, but well manured in the *hill* with a mixture of horse-dung, lime, and ashes; when the corn was fit for weeding, it was ashed by putting about half a pint of unleached ashes to each hill; a part, however, was left without any ashes. The difference was very visible between the corn, which had ashes applied to it, from that which had none; and the rapidity of the growth caused an early half hilling at this time, as also when the corn was weeded, it had a slight ploughing. After which a plough was not suffered amongst it; nor had it any more hoeing, except to destroy the worst of the weeds, and to stir in the turnip seed which was sown amongst it. The rapid growth and luxuriant appearance of this piece of corn, attracted the attention of all who passed on the road near it. In October, I measured off one acre; had the corn gathered, husked, and accurately measured, and there were $156\frac{1}{2}$ bushels of corn in the ear; several bushels of the ears were measured, then shelled, and measured again. The result was, two bushels in the ear turned out more than one bushel in the kernel. I, therefore, thought myself safe in calculating that this one acre produced $78\frac{1}{2}$ bushels of corn when shelled. The seed of this corn was presented me by Samuel Blagg, Esq. of Boston, who procured it from William Jarvis, Esq. of Vermont. It is a large yellow kernel of 12, 14 and 16 rows to the ear. I have counted upward of 700 kernels on a single ear. It is said by some to be the same kind of corn as that which has

been raised of late years by Gorham Parsons, Esq. of Brighton, and also by Samuel W. Pomeroy, Esq., and the same kind which he presented to the members of the Legislature when in session a few years since. For the present year, 1820, the same ground was ploughed last fall; again well ploughed this spring, furrowed out at a distance of four feet, leaving each furrow one foot wide. The furrows were well manured with a mixture of *horse dung, lime, ashes, and dock mud*. The seed raised the last year was planted in the drill on each furrow, making *three rows* to each furrow. Care was taken to drop the corn as near six inches apart as possible without wasting time. When the corn was fit for weeding, care was taken to thin it out where it was too thick; after weeding, it was ashed by spreading unleached ashes through each drill or furrow. It was evident this corn felt the effects of this last years manure, as the growth was more rapid, and called for a still earlier half hilling, which was applied with a slight ploughing; immediately after half-hilling, the suckers were all carefully cut off. No more ploughing or hoeing was applied, except so much as to destroy weeds and sow turnips. This corn was planted in the latter part of May; the stalks cut the first week in September, at which time much of the corn would have answered to have been ground. It remained in the field until the 13th of October, at which time it appeared as though some pains had been taken to strip it of the husks; but it is the nature of this corn to husk itself as it stands in the field. It is a species of corn, which, in good seasons, requires but ninety days from planting to be perfectly out of the way of frost, and much of it will, in that time, answer to be ground. An acre of this land planted in drills was measured, and the corn cut up, husked, and measured, which produced 222½ bushels of corn in the ear; several bushels of the ears were shelled, and measured in the kernel, and in every case it was found that two bushels of ears did produce rather over one in the kernel. Thus we fairly calculate, that we had from one acre of ground, one hundred eleven bushels and

one peck of corn. The land improved *was good* with a *deep black soil*, followed by a stratum of yellow loam, terminating with a hard pan of clayey gravel at the depth of about two feet. It will be found by planting in this mode, of *three rows to each furrow*, there will be more than double the stalks of corn in a rod, than in the usual way of planting in hills. Some may object to this mode, because they can plough only one way, and not cross plough. But it will be found, that it takes no more time to hoe the corn in drills than it will to do the *cross ploughing*, and it requires but one weeding and one hoeing. The third time of ploughing and hoeing is saved.

The foregoing is very respectfully submitted by the Committee's very humble servant.

JON. HUNNEWELL.

I hereby certify, that I have surveyed a piece of land on the farm of Jon. Hunnewell, Esq. of Newton, estimated by Mr. Thompson, his foreman, for an acre, and find that it *does not exceed one acre*.

ROBERT MURDOCK, *Surveyor*.

Newton, Nov. 18, 1820.

I hereby certify, that the above named piece of land is the same, and all the land which I estimated for an acre, and from which I and other named in a certificate given for that purpose, certified we gathered one hundred and eleven bushels of corn from.

JOSEPH THOMPSON.

Newton, Nov. 18, 1820.

Middlesex, ss. November 10, 1820. Personally appeared Joseph Thompson, and made oath that the foregoing certificate by him subscribed is true. Before me,

TYLER BIGELOW, *Justice Peace.*

Boston, Nov. 22, 1820.

SIR—I am happy to have it in my power to offer to the honourable committee that sort of evidence which is required of the production of one acre of land cultivated by me this year on my farm at Newton. Inclosed are the certificates, as also the statement of the kind of soil and manner of cultivation. Which is respectfully submitted by your humble servant.

J. HUNNEWELL.

Newton, October 20, 1820.

We, the subscribers, hereby certify, that we planted a piece of corn for Jon. Hunnewell, Esq. on his ground lying in Brighton; that we have cultivated and taken care of the same for him during the season, and did, on Saturday the 14th day of October, measure off very accurately one acre of said corn, gathered the same acre and husked it, and with great care measured the same, and kept an exact account of the number of bushels of ears it afforded, which was two hundred and twenty-two bushels and one half; and we are satisfied there is one hundred and eleven bushels of corn, which was raised on one acre of ground.

JOSEPH THOMPSON,
ABEL BAKER,
EZRA BAKER,
DAVID SPAULDING.

Further testimony shall be given, if required, as also the mode of culture, by yours respectfully.

JON. HUNNEWELL.

Worcester, Oct. 14th, 1820.

[To the Committee of Agricultural Improvements, of the Massachusetts Agricultural Society.]

GENTLEMEN,

THE following is the result of an experiment made upon an acre of land, planted, one half in hills, and the other, in rows.

The above parcels of land comprised a field of uniform quality, bordered with three rows of potatoes, which was ploughed late in the summer of 1817, after taking off a crop of hay, and sowed upon the furrow with winter rye. It produced twenty-five bushels. The stubble was then ploughed in, and the ground sowed with turnip seed. The season being indifferent, it produced but about sixty bushels, with a profusion of verdure from the scattered grain. Late in the autumn I carried on about one hundred loads of rich earth from about my yard and barn, part of which had in a succession of years, been washed from my field, and a part from an excavation of ground, on which I was preparing to remove my barn. This was spread and ploughed in. In 1819 I sowed it with wheat, which produced an abundant crop of straw, with only fifteen bushels of shrivelled grain. I turned in the stubble, and again sowed it with turnip seed. The season being more-favourable, I raised from it one hundred and sixty bushels. Intending to plant it with corn the next year, I carried on to the margin of the field about forty loads of compost manure. Early in May last, I gave it a deep ploughing, and cross furrowed it for planting, at intervals of four feet. The furrows were made six inches in depth. Being confident that the drill method of planting was the best, I had determined to have planted the whole field in this manner—but the man I had employed, mistaking my direction, had dropped a few loads in the mode for planting in hills, before I went to the field. As it would occasion additional labour to repair the error, I directed him to finish one half the field in this manner, and to spread the manure in the rows in the other half. I could then ascertain which was the best mode of planting. This accident, Gentlemen, brought me within the scope of one of your items for an experiment in agriculture, which then I had not noticed. I had two men at my cart, and employed one in covering the corn, which I principally placed myself, five kernels in a hill, placing four in a square, six inches apart, and the fifth in the centre, pressing

them into the manure. The hill when finished was nearly level with the ground. A row of hills contained two hundred and ten kernels. The planting was performed as near to the manuring as possible to prevent the drying and evaporation of the manure.

As nearly the same amount as could be judged, was spread in the rows, and the corn planted on the surface in a zig-zag course, crossing from side to side of a straight line, about three inches and at ten inches apart. When this was covered, there was a depression upon the surface of the furrow of about two inches, as the manure was more shallow in the rows than in the hills. Both parcels were planted on the 8th of May. At the time of planting, the ground was uncommonly dry and dusty for the season—but before the corn had time to vegetate, there was a succession of cold, heavy rains, which retarded its progress, and gave it an unpromising appearance, especially in the rows where the seed was more exposed to the wet, and less to the sun. Many stalks were missing. Making no calculation for accidents in the part which I personally planted, my crop in the rows, would have been much lessened, had not a small boy, who dropped the corn in a few rows in my absence, furnished me with the means of supplying the defect. From his *nursery*, I carefully transplanted with a trowell, a sufficient quantity to make the rows complete—amounting to at least two hundred plants. For some time after the first leaves had expanded, the corn throughout the whole field appeared almost stationary ; but there was a perceptible difference in favour of that in the hill. Before weeding, I dressed it with ashes, allowing an equal quantity to each parcel—about a gill to each hill. I back-furrowed it, and left the rows more accessible to the sun ; and loosened the earth between the hills, and among the rows, particularly about the corn, raising no more earth about it than was necessary to cover the ashes. This gave it a better colour and a more healthful appearance—still it retained its dwarfish state. Instead of the blade pushing up, it began to send out

suckers, like a diseased tree, more vigorous than itself. They were removed when they were from four to six inches high, and so slender as to yield to slight force. In some cases, I preferred the sucker to the stalk, and severed the latter—in some, I pulled up both. This was the most judicious course, where the original stalk is unpromising, as a sucker rarely produces fruit. In about a fortnight from the first hoeing, I gave it a second, previously putting about it the like quantity of ashes. I laid the furrow toward the corn, hoeing as before, and raising earth about the corn, enough only to cover the ashes; stirring the ground, and levelling the furrows to a smooth surface, leaving the earth flat and broad about the hill, and about four inches elevated—and in the rows, a flat surface of a foot on each side of the blade, a little more depressed than in the hills. In a few days after this process, I applied plaster, as I had ashes, and in about the same quantity. This was the last ploughing and hoeing, except a light stirring with the hoe to loosen the earth, and destroy a few remaining weeds. The corn in the whole field remained short, but grew *stocky*, and began to tassel at from fifteen to eighteen inches high. Many who viewed the field, judged that its appearance indicated a small crop—but from the commencement of the tasselling it grew vigorously—set abundantly for ears, in both hills and rows; and attained an early stature of six to eight feet throughout the field. The stalks were cut after the corn had become hard, and the inner husk a little dry. The field was measured, and the corn gathered on the second day of October. The produce from the half acre in rows was twenty eight and a half double bushels of ears. That in hills, produced twenty-three and a half double bushels, giving five double bushels of ears in favour of the half acre planted in rows; and making the whole produce of the acre fifty-two bushels of shelled corn. Difference in the expense of labour in the two parcels, not exceeding seventy-five cents.

Respectfully, your obedient servant,

O. FISKE.

Expende of cultivation, viz. :—

Ploughing, man, oxen and plough, - - - - -	\$ 1 25
Furrowing, horse, &c. - - - - -	50
Manuring, - - - - -	1 34
Planting, - - - - -	87½
Ploughing and hoeing, - - - - -	2 75
Harvesting, - - - - -	2 87½
	<hr/>
	\$ 9 59

I Nathan Shepard, testify and say, that I have worked in the employment of O. Fiske, Esq. from April last, and that the facts stated by him, as having taken place since I have been in his employ, are true. I further testify, that I assisted in harvesting the two parcels of corn, as measured by the Surveyor—that I carefully measured the produce of each parcel—and that their several amount is as above stated.

NATHAN SHEPARD.

Worcester, Oct. 14, 1820.

Worcester, ss. Oct. 16, 1820.—Then the above named Oliver Fiske and Nathan Shepard, personally appeared, and made oath to the truth of the above certificates, as by them severally subscribed.

Before me,

WILLIAM JENISON, *Justice of the Peace.*

I certify, that the above named Nathan Shepard, is a man of truth, and his certificate is entitled to credit with all persons.

WILLIAM JENISON.

I hereby certify that on this second day of October, 1820, I measured a part of a field belonging to Oliver Fiske, Esq. on which Corn grew this year, planted in rows, which part appeared to lie at right angles, and the rows uniform; this part as near as I could estimate by the chain, contained eighty rods, being half an acre. I also measured, and laid off from

the adjoining section, what I found to be an equivalent amount, of ground on which Corn grew this year, planted in hills.

JEREMIAH ROBINSON, *Surveyor*.

I hereby certify, that I assisted Dr. Robinson in measuring the above mentioned separate parcels of ground, and that I on the same day carted the Corn from the ground as measured, and deposited each parcel by itself, in two apartments in Dr. Fiske's barn.

JAMES WILLIAMS.

Worcester, ss. October 16, 1820.—Then the above named Jeremiah Robinson and James Williams, personally appeared, and made oath to the truth of their respective certificates as above signed, before me.

WILLIAM JENISON, *Justice of the Peace*.

I certify that the above named Dr. Robinson and James Williams, are men of truth, and their affidavits are entitled to credit with all persons.

WILLIAM JENISON.

Remarks and illustrations, as an Appendix to the within paper. My seed was from an ear of corn given me by Abraham Bigelow, Esq. of Cambridge, as an early kind, with a small stalk and cob, yielding a good crop, with less exhaustion of the land than the kind in general use. It has eight rows and its full length where I first received it was about eight inches. I raised my seed first from this in 1815. In 1816, a year peculiarly disastrous to corn, I planted half an acre from this seed, and an acre in a more favourable aspect, with our common eight rowed kind. The first came to maturity, the latter was cut off in the milk. I gave public notice of my success and sold or exchanged the seed at the rate of other corn. A thousand bushels would not have supplied the demand from this and the neighbouring states. It is now I believe generally used. It probably

originated from a more northern climate. Its dimensions are increased without materially losing its early quality. Twelve inches is not an uncommon length.

You will perceive, gentlemen, by the within statement, that I have not adopted the common practice of *late hoeing and hilling* corn—both of which I consider as extremely detrimental. The former disturbs and severs the roots which are in quest of food—and the other removes the food to a point, in the course of nature, inaccessible to them—forming a fulcrum over which the corn will break—or into which it will be imbedded in a conjunction of wind and rain without the power of *self erection*. My field was twice exposed to this occurrence and stood in all points of elevation from a horizontal line to an angle of 45° , with little injury to the corn, and little trouble in righting it.

The seed was soaked in strong brine 36 hours before planting. The stunted state of the corn in its early stage, I impute to the wet and cold which succeeded the planting. I rarely plant earlier than the 20th of May—but as the ground was becoming very dry, I hastened the planting, fearing so great a drowth as would prevent the seed from vegetating. Having published a theory on which I practised in the management of corn, I left four rows to the *course of nature*, that I might determine whether *suckering* corn was useful, as I contended. In these four rows there were seventeen stalks more than in four rows contiguous which had been suckered, and the produce was half a peck less.

The whole field was more infested with smut, than any which I have before noticed in any season, and more than I have seen the present year in any other field. Whether this was occasioned by a vitiated state of the fluid, arising from the insalubrity of the early part of the season—or from its *excess* in the latter, I am unable to determine—but I am inclined to the latter opinion from the consideration, that at the period for forming and filling the ear, the season was uncommonly favourable to vegetation, and the process was pressed with uncommon rapidity. Hence I infer that the

sap in its crude state, flowed faster to the ear than could be assimilated and purified into grain, and expanded in smut. This excess would probably be greater where vegetation had been checked, as in my field in the early part of the season. If my theory be correct, the reason is obvious why my corn was more smutty than that of my neighbours, who planted later, and where its progress was uninterrupted.

Incidentally in the above experiment, I have ascertained, that corn may be transplanted without injury. Care however ought to be taken in planting to allow for accidents, as it is better to pull up the surplus, than to supply a defect by transplanting or replanting—the latter I should never practice, unless the field was so generally and so early destroyed as that it would do to replant the whole—as I never knew a field succeed well, intermixed with *early* and *late* planting. You will observe gentlemen, that my mode of *planting* in the *hill* gave as much advantage to this culture as possible. I intended to have had the same number of kernels in the rows as in the hills—but I found they rather fell a little short—still I think it stood as thick as would be profitable, as I observed those stalks produced the best, which had the most space.

O. FISKE.

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN.—In entering the lists of competition for your premiums on agricultural products, I deem it necessary to state that the land in which one acre of potatoes were raised (and entered at Brighton, October 16th 1820,) the present year, was broken up in October, 1819. The two years previous, had been used as part of a sheep pasture, on which the sheep were folded at night. The situation of the land, is near the foot of a heavy swell, and is gently in-

clining to the east, the soil a dark yellowish loam, such as we call chesnut land. In the spring of 1820, the land was cross-ploughed and harrowed, and between the 21st and 27th of May, the crop was put in, in the following manner. Six furrows were cut lengthwise the piece, (as owing to the local situation of the land, the whole manure had to be carried across the field in various directions, which will account for six furrows at a time only.) The manure, (which in quantity, was about 37 loads, and in quality, that made from neat cattle and sheep, the 20 loads from sheep was $\frac{1}{4}$ straw, their winter litter) spread in, and the cut potatoes planted one foot apart, the horse plough then followed, throwing the loam on the manure and potatoes; this again followed by the hand hoe to dress down, or add the loam, which completes the process in about half the time and much better, likewise, than the same entirely performed with the hoe.

In ten days the weeding commenced by running the horse-plough as near the manure as possible, throwing the loam in a ridge between the rows (which were 3 feet apart) following with the hoe to dress the plants. About the 22d June, the ridges were split with the horse-plough, throwing an equal quantity of the same to each row, followed with the hoe as above. The vines at this time were not more than 8 inches in height and not yet in the bud. From this time, the field was not entered till harvest which commenced the 23d October and on finishing the same, had by admeasurement, six hundred and fourteen bushels.

The seed used, was forty bushels, part the Rio-de-la-Plate reds, and the remainder the Fitchburg whites. The reds gave a superior yield on a like quantity of land in the proportion of six in eleven, in bushels, but the whites were five pounds in a bushel the heaviest.

I would here observe (with much deference to the opinion of more experienced farmers) that as the present season has been too hot and dry for potatoes, I think 700 bushels can be produced from the acre in this country in

our best seasons, for the successful culture of this valuable root.

The land on which I raised one acre of wheat, the present season (as entered at Brighton, October 16th, 1820,) was in 1819, occupied with a crop of Indian corn, manured at the rate of 20 buck loads to the acre, ploughed in. After taking off the crop in the fall, the land was coarsely ploughed. In the spring of 1820, the land was cross-ploughed and on the 18th of April, after the seed had been soaked in brine, the strength of sea water, thirty-four hours, drained, and a sufficient quantity of wood ashes, mixed with it, was sowed at the rate of 3 bushels to the acre, (which, experience declares to be one sixth part too much,) and harrowed in across the furrow, following with the grass seed, which was again cross-harrowed and left in this situation till about the middle of July, the crop then harvested and when threshed and cleaned measured nineteen bushels.

It is perhaps unnecessary to observe, that owing to the intense *heat* and *drought*, of the season, crops of wheat in this part of the country have been comparatively small with former years: this together with the inauspicious visit of a squall of hail, (before the grain was ripe, which broke one half of it down) will account for the small crop above.

Expence arising from the culture of one acre of potatoes
in the year 1820.

Breaking up	- - - - -	\$5,00
Cross-ploughing and all other labour in planting		12,00
37 buck loads manure	- - - - -	37,00
40 bushels potatoes, at 25 cts.	- - - - -	10,00
2 hoeings	- - - - -	8,00
harvesting the crop, 1 man 20 days at 75 cts.	-	15,00

\$87,00

PAYSON WILLIAMS.
AARON BIXBY.

Worcester, ss. November, 8th, 1820. Personally appeared Payson Williams, and Aaron Bixby, and made oath, that the foregoing statement subscribed by the said Payson Williams, and the said Aaron Bixby, contains the truth,

Before me,

CALVIN WILLARD, *Justice of the Peace.*

This is to certify that I, Philip F. Cowdin, being sworn surveyor of the town of Fitchburg, in the county of Worcester, have this day surveyed a certain piece of potatoes, for Payson Williams, of Fitchburg, in the town and county aforesaid, and find the same to contain one acre and no more.

PHILIP F. COWDIN.

Fitchburg, September 28th, 1820.

This is to certify that I, Philip F. Cowdin, being sworn surveyor of the town of Fitchburg, in the county of Worcester, have this day, surveyed a certain piece of ground, sown this present season, with spring wheat, for Payson Williams, of Fitchburg, in the town and county aforesaid, and find it to contain one acre, and no more.

PHILIP F. COWDIN.

Fitchburg, September 28th, 1820.

Jamaica Plain, 20th Nov. 1820.

[To the Committee on Agricultural Experiments.]

GENTLEMEN,

HAVING the last year addressed a note to the Secretary of the Society on the subject of the culture of *Mangel Wurtzel*, of which vegetable I had just been raising a small patch—and from the high opinion I therein expressed of its value, I

thought it my duty to attempt its cultivation this year on a larger scale, having procured fresh seed from Holland. I now beg leave to give you the result.

The land used for the purpose had been for four years chiefly cultivated with carrots—is a deep light loam on a dry gravel bottom,—and on the same spot are upwards of fifty apple and pear trees, of 10 to 15 years old. This year about 24 ox-cart loads of compost manure were used; on part of the land it was spread and ploughed in, and on part it was put in the furrow under the seed—the whole was thrown in ridges with the double mould board plough, about two and a half feet apart, then flatted a little, and the seed put in, with the fingers, at six inches apart. They were afterwards thinned to a single plant, and after they had attained considerable size, every other one was taken up and used as food for my hogs, being boiled. They were hilled with the double mould board plough, and hoed alternately three or four times during the season.

I am well convinced the whole labour on them was fully paid by the trimmings and thinnings, which my people all estimated, including those pulled within six weeks of harvesting, at not less than one hundred and fifty bushels of roots.

In the month of July the season was so dry, I feared I should almost lose my crop by drought. I think a soil naturally more moist would have been better for them. I am, however, well satisfied with the result. On the 12th of October we commenced taking them up, first cutting the tops and carting them off to the oxen and cows, the roots were then pulled, and on the 14th the whole were housed or pitted at an expence of less than ten days work on 504 baskets—24 of which I myself weighed, the average of which was 75 21-26 lb. net—and calculating, by the society's rule of 56 lb. per bushel the produce *then gathered* was 682 bushels from 1 acre and 2 rods, as appears by the surveyor's certificate, herewith handed. There being no hay-scales within three miles and not wishing to market any of these roots, I

thought the trouble too much to send them, and presumed the Committee would be satisfied with the weight as above expressed.

It must be observed that allowing 10 days labour in harvesting, each man must have got in 68 bushels in one day's work, four times as much as that of harvesting potatoes. All sorts of stock are fond of them, much more so than of *Ruta Baga*, and they are, I think, a more certain crop, having fewer enemies to encounter. They are not, however, so easy to keep through the winter. I last year kept (in a pit) in the field those intended for seed, which did remarkably well,—and this year I have pitted 200 bushels, by digging a trench 3½ feet wide and about 1 foot deep, putting a layer of straw on the bottom and piling them about 3 feet high, and covering them with straw five or six inches deep, and then covered 6 or 8 inches with the soil taken from the trench—observing not to cover them too thick, till the weather becomes quite cold.

On three square rods of the above ground an average of 1800 bushels per acre was produced. The seed was planted the 28th of April.

I am, very respectfully, yours,

JOHN PRINCE.

N. B. I have this fall procured a double mould board plough and horse-hoe with circular cutters—the mould board and hoes are expanding, and can be worked in rows of any width from 18 inches to 3 feet apart, with this implement, in a free easy soil, I think the *hand hoe* will not be much required.

Roxbury, Nov. 20th, 1820.

I Mather Withington, of Dorchester, a sworn surveyor, having been requested therefor by John Prince, Esq. of said Roxbury, hereby certify, that I have this day surveyed a piece of ground on which, as had been stated by him, a crop

of Mangel Wurtzel had recently been taken, and find it to measure one acre and two rods. I also found on the said ground forty-nine pear and apple trees, from ten to twenty feet in height—also within one foot, on the eastern border, eighteen other trees, of apple and pear, of like height.

MATHER WITHINGTON, *Surveyor.*

Roxbury, 28th Nov. 1820.

We the subscribers hereby certify and declare, that we have worked on the farm of John Prince, Esq. during the whole of the past summer, that we have assisted in cultivating a piece of ground with Mangel Wurtzel, that we have seen the statement made by Mr. Prince of the culture thereof and the produce, and that so far as relates to the labour of *this year*, the manure, the produce and weight of the same, we can attest to the accuracy thereof.

EPHRAIM DOWNES.

LEONARD NEWTON.

Norfolk, ss. Roxbury, Nov. 28th, 1820. Then the above-named Ephraim Downes and Leonard Newton appeared, and solemnly swore to the truth of the above by them signed. Before me,

JOHN PARKER, *Justice of the Peace.*

Brighton, Nov. 3, 1820.

AN account of the culture and produce of one acre of Cabbages by Francis Winship, of Brighton, in the county of Middlesex: The land on which the Cabbages grew, is the same on which the ploughing-match took place in the year 1817, was cultivated with corn and potatoes in the year 1818, and with potatoes in the year 1819. The last spring it was

ploughed once. In June it was ploughed again, and struck into furrows from $2\frac{1}{2}$ to 3 feet apart. I then dropped leached ashes into the furrows, one shovel full making three or four hills 15 or 20 inches apart, it was then mixed with the loam and covered; a boy followed with the seed, and penetrated the hill with his thumb and finger, and deposited three or four seeds. This was performed the latter part of June. They were afterwards weeded and thinned as convenience suited, probably equal to three dressings. On the 8th of the present month Mr. Tufts surveyed the land, and ascertained that there was one acre of the same kind, he then set off one eighth part of an acre, pointed the same out to myself and my man Mr. Pierce. It was taken from the centre and considered a fair average of the acre. From this eighth of an acre we ascertained that forty of the heads had been taken away by the market man,—we therefore selected forty cabbages from the neighbouring rows, and put the same to the produce of an eighth of an acre. They were then taken (making three loads) to the scales, and weighed, as appears by the weighers ticket, eighty hundred and one quarter,—this multiplied by eight makes thirty-two tons and two hundred.

FRANCIS WINSHIP.

Brighton, 9th Nov. 1820.

Three loads Cabbages, owned by Francis Winship, driven by Mr. Peirce, weight	- - - - -	118	1
Tare	- - - - -	38	0
Nt. Wt.	- - - - -	80	1

SAMUEL DUDLEY, }
 OTIS FAY, } *Weighers.*

Brighton, Nov. 9, 1820.

This is to certify that I have lived with Francis Winship the summer past, and assisted in the cultivation, collection, and weighing, and was present when Mr. Tufts surveyed and

pointed out the above eighth part of an acre of cabbages, and the above statement is correct and true.

HIRAM PEIRCE.

Brighton, 8th Nov. 1820.

This will certify that I surveyed this day a piece of cabbages for Francis Winship, of Brighton. I first ascertained that there was as much as one acre of the same kind of drum-head cabbages. I then pointed out to him, and his man, one eighth of an acre to be weighed.

PETER TUFTS, Jr. *Surveyor.*

Middlesex, ss. Brighton, Nov. 29, 1820. Then personally appeared the above-named Francis Winship and Hiram Peirce, and made oath that the above certificates by them subscribed is true, before me.

EDWARD SPARHAWK, *Justice Peace.*

We, Ebenezer Thrasher, husbandman, Moses Cricket, and David Trasher, all of Salem, in the county of Essex, on oath testify as follows,—

That sixteen tons and thirteen hundred weight, together with one hundred and eighty three bushels more, of Carrots were raised on an acre of the farm in said Salem, occupied by the above named Ebenezer Thrasher, the same acre measured in our presence by Mr. Jona. P. Saunders, surveyor; and we know the above quantities were dug on said acre, from time to time, from the 6th November last, to the 14th December inst.: we all assisted in digging the same.

The weight of all said Carrots, except of the one hundred and eighty three bushels, was ascertained by E. W. Fabens, Town Weigher.

EBENEZER THRASHER.

DAVID THRASHER.

MOSES CRITCHET.

COMMONWEALTH OF MASSACHUSETTS.

Essex, ss. December 14, 1820. Then the abovenamed Ebenezer Thrasher, Moses Critchet, and David Thrasher, severally subscribed and made oath to the truth of the above affidavit, before

BENJAMIN MERRILL, *Justice Peace.*

The words "one hundred and eighty three," were interlined before signing and taking the oath.

B. MERRILL, *Justice Peace.*

Salem, Dec. 14, 1820.

This is to certify, that I, the subscriber, have cultivated the land on which I raised an acre of Carrots, the past season, as follows: May 1, carted three and a half cords manure and spread the same—10th, ploughed it—11th, harrowed it—12th, carted on three cords manure—13th, harrowed it again—17th, ploughed it—18th, raked it over—19th and 20th, sowed it with three pounds of carrot seed, and three pounds radish seed—June 8th, hoed the same between each row, the distance between the rows being seventeen inches—15th, hoed and weeded the same—29th hoed the same again—July 10th, hoed and weeded the same for the last time; the above being all the manure and labour done on the above land during the season. EBENEZER THRASHER.

This certifies that drafts of Carrots weighed as follows, belonging to Mr. Ebenezer Thrasher, of Salem.

Nov. 6, 1820.	GROSS.			TARE.			NEAT.		
Horse Cart,	18	3	16	5	0	23	13	2	21
	18	1	2	5	1	16	12	3	14
	19	2	16	5	1	16	14	1	0
9th,	16	0	16	5	1	16	10	3	0
Horse Waggon,	19	2	2	5	0	23	14	1	7
	17	2	2	5	1	16	11	0	14
17th,	14	3	2	5	2	2	9	1	0
24,	17	3	2	5	2	16	12	0	14
	18	3	16	5	2	16	12	1	0

	GROSS.			TARE.			NEAT.		
25,	18	1	2	5	2	16	12	2	14
	11	1	9	5	0	23	6	0	14
27,	16	1	16	5	0	23	11	0	21
	18	1	9	5	0	23	13	0	14
	17	0	23	5	2	2	11	1	21
Dec. 4,	17	3	16	5	2	16	12	1	0
6,	15	0	2	5	2	2	9	2	0
8,	17	0	23	4	0	23	12	0	0
	17	2	16	5	2	16	12	0	0
	17	2	2	5	0	23	12	1	7
	17	2	2	5	2	16	11	3	14
9,	12	2	2	5	2	2	7	0	0
	17	3	16	5	0	23	12	2	21
	16	1	2	5	1	16	10	3	14
	18	1	2	5	2	16	12	2	14
14,	18	2	2	5	0	23	13	1	7
	18	2	16	5	2	16	13	0	0
	19	2	16	5	0	23	14	1	21
	17	0	16	5	1	16	11	3	0

Cwt. 333 0 0

A true copy. Attest.

E. W. FABENS, *Weigher.**Salem, Dec. 14, 1820.**Salem, 6th November, 1820.*

I hereby certify, that at the request of Mr. Ebenezer Thrasher, I measured a piece of land in South Salem, and staked off as part thereof, *one acre*, the same having Carrots thereon.

JONATHAN P. SAUNDERS,

*Sworn Surveyor.**Salem, December 14, 1820.*

This is to certify, that we have raised on the land on which we raised an acre of beets the past season, eleven hundred dozen of radishes, according to the best of our knowledge.

Also, on the land on which we raised an acre of Carrots, we also raised sixteen hundred dozen of Radishes, according to the best of our knowledge.

EBENEZER THRASHER.
DAVID THRASHER.

We, Moses Critchet and David Thrasher, resident at Salem, in the County of Essex, husbandmen, severally on oath testify :

That the said David wrought in the employment of Ebenezer Thrasher, of Salem, on the farm in Salem, occupied for several years past by said Ebenezer, and said David was present and assisted during the months of August, September and October last, in digging and putting into barrels the crop of Beets raised on one acre of his farm, the same surveyed by Mr. Jonathan P. Saunders ; and the said David knows, that three hundred and twenty-three barrels of Beets were in said months raised on said acre of ground, which he assisted in digging and barrelling—twenty-five barrels of the same were dug and sold in August ; of which I informed Critchet.

The said Critchet declares he began to work for said Ebenezer, in September last ; that part of the Beets growing on said acre had then been dug and carried away ; that he was informed twenty-five barrels had been dug, which he believes to be true ; that in September and October last, he assisted the said Ebenezer and David in digging and barrelling two hundred and ninety-eight barrels, the residue then on said acre, and he has no doubt the whole must have been three hundred and twenty-three barrels.

DAVID THRASHER.

MOSES CRITCHET.

I, Ebenezer Thrasher, of Salem aforesaid, husbandman, on oath testify,

That I raised, dug and barrelled during the months of September, August and October last, on one acre of the farm I occupy in Salem, the same acre surveyed by Jonathan P. Saunders, three hundred and twenty-three barrels of Beets.

EBENEZER THRASHER.

COMMONWEALTH OF MASSACHUSETTS.

Essex, ss. November 29, 1820.—Then the abovenamed Ebenezer Thrasher, David Thrasher, and Moses Critchet, severally subscribed and made oath to the several aforewritten affidavits, by them respectively subscribed.

Before me,

BENJAMIN MERRILL, *Justice of the Peace.*

Salem, December 14, 1820.

This is to certify that I, the subscriber have cultivated the land on which I raised an acre of Beets, the past season as follows :— April 10th, I begun to cart manure on the land—I carted and spread 4 cords. 18th, ploughed the land. 19th, harrowed the same. 29th, carted four cords more of manure and spread the same. May 4th, ploughed it again. 5th, harrowed the same. 8th, ploughed it over again. 9th, raked it over and sowed it with six pounds of seed (Beet) and four pounds of Radish seed. June 1st, hoed the same between each row, the distance between the rows, being two feet. 9th, hoed the same again. 12th, weeded the same. 28th, hoed through again. July 3d, hoed and weeded again the above, being all the manure and all the labour that was done on the above named land during the season.

EBENEZER THRASHER.

Salem, August, 1820.

I hereby certify, that, at the request of Mr. Ebenezer Thrasher I measured a piece of land in South Salem, and set off therefrom one acre, having thereon Beets—growing.

JONATHAN P. SAUNDERS,

Sworn Surveyor.

Salem, 18th December, 1820.

DEAR SIR,

I received yours this morning, and seeing Mr. Thrasher, he furnished me the inclosed Certificates.

It is always the practice to top both Beets and Carrots before weighing. I saw him pack and weigh the barrel of Beets, and he assures me, they would have weighed much more when they were first taken from the earth. Estimating a bushel to weigh 56 lbs. a barrel contains 3lbs. short of 2 1-2 bushels. I think a bushel just dug would weigh over 60 lbs.

I am yours, with great respect,

E. HERSEY DERBY.

THOMAS L. WINTHROP, ESQ.

I hereby certify that I weighed one barrel of the Beets, packed in the same manner as I packed the others, that it weighed 156 lbs., the barrel 19 lbs. ; the neat weight of Beets being 137 lbs. ;—and I have no doubt had I have weighed all the others they would have contained an equal weight of Beets.

DAVID THRASHER.

I hereby certify, that all the Carrots were topped before they were sent to the town scales.

DAVID THRASHER.

[To the Trustees of the Massachusetts Agricultural Society.]

GENTLEMEN.—The following statement is made in consequence of my application for your premium, on a crop of the common English turnip ; but it is unfortunate for me, I cannot give you the total amount of the crop. The selection of this tract for turnips was, in part, its adjoining the road and in full view of the public, to induce them to aban-

don the practice of sowing broadcast, and sow them in rows, as was my practice; but upon measurement it was found to contain one acre within the fences, which, the head-lands not being ploughed, left not one acre actually sowed. The situation of the land being low and flat on the clay (as we term it) and my neglecting harvesting till the beginning of November, the early snows and frost have prevented me from finishing; but we have gathered and measured four hundred and twenty bushels from one hundred rods, the remaining I must feed off with my stock when permitted. My mode of culture is as follows;—The middle of July I ploughed my ground, which had been mown a few days before, and had been down to grass for ten years, and cut about three-fourths, of a ton to the acre. Then I drew on eight cords of manure, which was a composition of marsh mud and manure, made by my flock of sheep, which I spread on and harrowed in; then I shallow-ploughed it in small ridges, then with a machine I sowed two rows on a ridge, and covered it with a light harrow. The rows were two feet apart between the ridges, and one foot on the ridge, which took half a pound of seed. I thinned them to the distance of one foot apart; the first of August I ploughed and hoed them; I hoed them again the latter part of the same month. The whole expense of labour of ploughing and sowing, and thinning, hoeing, &c. do not amount to more than fourteen days works, including harvesting.

P. S. I have stated above, that I sowed my turnips the middle of July. There were twenty rods on one side that I omitted sowing till August, which were so late that the September drought injured materially. Respectfully yours,

TRISTRAM LITTLE, *Owner.*

HENRY TANDAY, *Assistant.*

BENJAMIN GUILD, Esq.

Newbury, Nov. 29, 1820.

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If requested, I would give you the statement of the crop, and of the measure of the land, under oath.

TRISTRAM LITTLE.

Newbury, Dec. 25, 1820.

MR. THOMAS L. WINTHROP,

SIR,—In answer to yours of the 16th instant, respecting my turnip crop, I shall state to you that they were completely topped, as we term it, or, in other words, they were fit for the market, as a part of them were sold in Newport market, and a part was sold on the ground, and the purchaser trimmed or topped them to his fancy, and the remainder I put in my cellars for the use of my stock. The following certificates are those requested. I am respectfully your obedient servant.

TRISTRAM LITTLE.

These may certify, that we assisted T. Little in harvesting his crop of turnips, and we saw four hundred and twenty bushels measured from a part of his ground.

HENRY LITTLE,
HENRY TANDAY.

Essex, ss. December 25, 1820. The above named Henry Little and Henry Tanday made oath to the truth of the above certificate by them subscribed before me

EBEN. MARCH, *Justice of the Peace.*

This may certify, that I have measured a piece of land for Tristram Little, from which he says he gathered four hundred and twenty bushels of turnips, and it contains one hundred rods, and no more; it was a part of the ground sowed with turnip, which he entered for your premium.

EBEN. MARCH, Jr.

Essex, Dec. 25th, 1820. Then the above named Ebenezer March, Jr. made oath to the truth of the above certificate by him subscribed before me

EBEN. MARCH, *Justice of the Peace.*

This may certify, that I passed through Mr. Tristram Little's field, at the time that he was harvesting his turnips, and saw a cart load standing there, which was represented to contain forty-two bushels, and gathered from a piece of ground which I assisted in measuring at that time, which did not exceed eight rods. I have no doubt as to the correctness of facts above stated.

DAVID LITTLE.

Boston, Jan. 27, 1821.

[To Dr. Dexter, President of the Massachusetts Agricultural Society.]

SIR,

ALTHOUGH I am sensible, that horticulture forms but a comparatively small branch of the duties of an Agricultural Society, and is entitled to a very inferior degree of attention, yet it is not to be entirely overlooked. It is with these views, that I communicate to you my experiments of the cultivation of the sweet potatoe of Carolina, a name by which it is more generally known, though the plant is not an indigenous or native one of that State. The eagerness with which it is sought when imported from the southern states, and the high price paid for it, are sufficient proofs that it is a valuable addition to the luxuries of our tables. The price we pay for it ordinarily is at least equal to three times its first cost, it being sold in the Charleston market from fifty to seventy-five cents per bushel, while it ordinarily costs us from 150 cents to two dollars.

I had heard of the successful cultivation of this plant at Plymouth, in this State, by Mr. Davis, the father of several of our most respectable citizens; and I always believed, that a little attention would enable us to naturalize it in our climate, as it is well known that it has for a long time been successfully cultivated in the State of New Jersey.

The complete success which attended the cultivation of it in 1819, by some of us, from your distribution of slips of the

plant received from Colonel Haskell of South Carolina, induced me to import a bushel of the slips the last spring from New Jersey, under the belief that, having been in some degree accommodated to a more northern climate, it would more readily flourish and produce perfect roots or tubers with us.*

I accordingly planted it the last spring on about a 20th part of an acre, and it succeeded far beyond my most sanguine hopes; so much so, that I can without any hesitation venture to assert, that 300 bushels per acre may be easily raised. What is of more importance, I can assure the public, that in point of quality and sweetness, the potatoes were at least equal to the best ever imported from more southern climates. The season was, however, unusually favourable; and I do not mean to intimate, that the success will always be as great. I am inclined to think, that the plants should always be started in hotbeds, as they require an unusual length of time before they appear above the ground. I dare say no more upon the credit of two successive experiments, but after another trial I hope to be able to point out the best mode of culture of this valuable root. Yours respectfully,

J. LOWELL.

Salem, January 22, 1821.

[To the Corresponding Secretary.]

DEAR SIR,

HAVING adopted a mode of managing my tillage lands for two years past, which has been attended with considerable success, I wish, through the medium of the society, if thought worthy of publication, to communicate the result of it to the agricultural community.

My farm, like most others in Massachusetts, consists mostly of upland and swamp and meadow lands. Instead of spread-

* I had the roots for six weeks successively on my table, in the highest perfection and in abundant quantities.

ing gravel on the meadow lands, as has been customary, I have drained the meadows, carted the mud from them to the upland, spread it from four to six inches thick, and ploughed it in. The effect, on a gravelly knoll, which has been very slightly manured for several years past, and on which corn was planted in 1819 before the mud was applied, was, that in 1820, after the mud was spread and ploughed in, but with similar management in other respects, three times as much corn was produced as the same land bore in 1819. On a piece of hilly pasture land, with a gravelly soil, first broken up about three years since, I raised, in 1820, a crop of potatoes, eight hills of which, on an average, in a high part of it, where the mud had been plentifully spread and ploughed in, produced a bushel, when, in the other parts, from twelve to twenty hills were required for a bushel, although a small quantity of mud and slacked lime had been ploughed into the whole piece, and my men had deposited mud taken from the barn yard and barn cellar in all the hills as manure; but this latter application appears to have had very little effect, probably from the mud not being mixed with the other ingredients of the soil.

To all persons, who have attended to agriculture as a science, it is well known, how necessary due proportions of silex, alumine and vegetable matter, in a mixed state, are to the existence of a vigorous vegetation. Soils thus constituted are particularly well calculated to acquire and retain moisture from rains and "atmospheric absorption." The properties favourable to vegetation, acquired by the land, must be of great durability also, unless from the form of the land, the fine particles be washed from it by rains, &c. Another advantage is, that whether the meadow be deep or shallow, much more arable land is produced than by the common method. If the meadow be deep, vastly more tillage land is obtained with the same amount of labour, as the gravel when spread in the common mode is continually sinking into the soil of the meadow; and if the meadow be

shallow, by draining it and removing all the mud which can conveniently be taken, a sufficient quantity will still remain to be ploughed into the gravelly sub-soil, and good tillage land thus be produced ; and many of our swamp and meadow lands are capable of being easily drained sufficiently for this purpose.

Perhaps it is proper to state, that I have carted the mud to the upland in the fall, that it might be hove by the frost in winter. It is much more easily pulverized in consequence in the spring.

I will only add an extract from a late publication on agriculture. " In supplying animal or vegetable manure, a temporary food only is provided for plants, which is in all cases exhausted by a certain number of crops ; but when a soil is rendered of the best possible constitution or texture, with regard to its earthy parts, its fertility may be considered as permanently established. It becomes capable of attracting a very large proportion of vegetable nourishment from the atmosphere, and of producing its crops with comparatively little labour and expense."

I trust it will be understood, that I have applied the mud only in cases, where considerable gravel would be mixed with it by ploughing. Hoping these suggestions may lead to further experiments, I am, with great respect, your obedient servant.

WILLARD PEELE.

[THE following communication from General H. A. S. Dearborn, of Roxbury, on a subject of great importance to the agriculture of this State, we insert with great pleasure. It cannot be doubted that the Locust tree (*Robinia Pseud-Acacia*) will flourish as well in the climate and soil of Massachusetts, as in any more southern part of the United States. Many of us recollect, that these trees forty years since, formed some of the finest ornaments of our public roads, and

often attained a size which would render them useful in naval and civil architecture. Their failure since that period, has been in a principal degree, owing to the destructive insect which General Dearborn has described, and of which, he sent to the Trustees of the Massachusetts Agricultural Society, specimens in the Larva, Chrysalis, and perfect state. Whether the modes which he has recommended of destroying them are the best, of which he modestly expresses his doubts, still, no man can doubt, that he is entitled to public gratitude for the attention which he has paid to the subject,

We earnestly request the co-operation of other intelligent gentlemen in the investigation of this question.

As the tree will flourish in our soil and climate, and can endure our winters—as it has been seen of a height of fifty feet, and a diameter of two feet, we think the question of its adaptitude to our climate at rest. We request the attention of scientific gentlemen to the following questions, and solicit communications of their opinion upon them.

1st. Are there any causes, which favour the production of the insect so fatal to these trees in our climate, which do not operate in more southern regions ?

2dly. Are there any more efficacious methods than these recommended by General Dearborn, for their extirpation ? and if any, what are they ?

3dly. Would it be expedient to introduce the seeds of the Locust tree from the south, and to offer premiums to those who should exhibit the finest nurseries of them, free from the insect which has proved so fatal to them ?

The Trustees would be happy to receive any communications on this subject. It would seem to them impolitic to abandon the cultivation of a valuable forest tree, because for a few years its culture had been unsuccessful. To meet, and overcome the impediments, which nature occasionally interposes to the cultivation of particular plants, seems to be the province of intelligent agriculture. It is a law, which we cannot disobey or despise, and seems to be one of the conditions of our enjoyment of the blessings of providence.]

Brinley-place, Roxbury, January 5th, 1821.

[J. Lowell, Esq. Corresponding Secretary of the Massachusetts Agricultural Society.]

SIR,

HAVING a number of Locust trees on my grounds, which have been, annually, much injured by a worm, that perforates the trunk and larger branches, in so many directions and so deep, as to cause them to be easily broken down by the wind, I have endeavoured to discover some method, of, either destroying those little enemies, or, of protecting one of our most valuable timber and magnificent ornamental trees from their ravages.

In the first number of the fifth volume of the "Massachusetts Agricultural Journal," is an interesting communication on this subject; but the insect, which has attacked my trees, is not the same as there described, as you will perceive, from an examination of those herewith transmitted, and the facts I have the honour of submitting.

Before it was possible to know how to attack this devastating insect with any hope of success, it was necessary to become acquainted with its character and habits, which, after several years of careful investigation, and minute attention, I have, happily, accomplished.

In the small box, I send a number of the perfect insects, both male and female;—phial No. 1, contains the larva, and No. 2, the chrysalis.

From the first to the twenty-fifth of September, the flies are to be seen on the trunks of the trees;—the female very active in seeking out little interstices between the rough exterior bark, in which to deposit her eggs;—during nearly the whole of the time the male continues on her back, and is thus borne about, and after each deposition, they copulate. From four to nine eggs are deposited in each place, and often, not more than four minutes intervene between the depositions.

I had cut out pieces of the bark, containing receptacles of eggs, to accompany the insects, in their various stages; but, unfortunately, they have been lost. The eggs are snow-white, and about the size of yellow mustard-seed. Before the cold weather commences, the young larva appear, and resemble a maggot; they just bury themselves in the tender inner bark, where they remain, until the first of April, sometimes later, according to the season, when they commence boring, and soon pass into the solid wood. It can always be ascertained, when, and where they have begun their destructive labours, as the sap oozes out from the wounds they have inflicted.

By the twentieth of July the larvæ have attained their full size, and cease to bore; those sent, were taken from a large limb of a tree, sawed off and split open, for the purpose of ascertaining their state and position. This I had done, at different periods, in June, July, and August, to examine them in their various changes. On the twenty-eighth of July, those in phial No. 2, were taken out, and the perfect insects were caught on the trees the third of September.

From several years observation, having obtained the preceding facts, I determined, last spring, to endeavour to rescue my trees from farther injury. The moment it was discovered the young larvæ had commencing boring, I white-washed all the trees, as high, among the branches, as any of them were discoverable at work; the next morning, I was pleased to find a vast number dead, on the outside of their holes; the white-washing was repeated for four or five consecutive mornings, when, the trees being completely coated with lime, I ceased, and was in hopes, that those, which the liquid alkali had not killed, would be destroyed by the exclusion of the air, which is the case with all kinds of borers;—but in the course of a few weeks, it was perceived, there were many busily at work; the saw-dust which they made, was pushed out from the holes, and indicated that not a few were still alive. The holes were then stopped up with pure

lime-mortar, and the trunks and branches of the trees immediately covered with a thick coat of white-wash ; but, the succeeding day, it was found many of the holes were opened, and the saw dust continually falling from them, left no doubt of the unabating industry of the worms. Presuming that the lime-mortar was pressed out before it was dry, I had some made, to which, calcined plaster of Paris was added, to facilitate the desiccation, and render it so hard and compact as to resist the efforts of the worms to obtain air,—and again white-washed the trees ;—this did not produce the desired effect, and I concluded to give up that mode of attack, with the intention of awaiting a more favourable period to renew hostilities.

When it was ascertained they had ceased to bore, and were passing to the chrysalis state, and of course inactive, I had the holes filled up with mortar, and the trees thoroughly white-washed to *prevent the escape* of the perfect insect, when ready to fly, as the cement would, before that time, become quite hard ; but in a number of places, the decayed bark, or white-wash peeled off, and drew out with it the mortar from the holes, so that, at the proper season the flies appeared, but less in number, than in any preceding year ; and they found it extremely difficult to procure suitable places in which to deposit their eggs, as I, particularly, observed, they avoided every spot which was covered with lime, and eagerly sought such sites, as rendered it certain, that when the young larvæ appeared, they should be in direct contact with the inner bark, from whence they might obtain sustenance ; and the peculiar formation and growth of the bark of the Locust renders this easy, it being crooked into such fissures, from the rapid increase of the wood, which necessarily rends the external bark asunder.

Thus, I have, perhaps, failed in the complete accomplishment of my object, but am still induced to believe, that by a little attention to the trees the next spring, to succeed ; if I do not, it will enable others, after becoming acquainted with the character of the enemy, and his mode of operations, to

prosecute a war against him, that shall be more successful and fortunate in its results.

I intend, should this experiment fail, to head down all my locusts in the latter part of April, and burn up the wood, which will effectually destroy all the remaining larvæ on my land; and as the trees are of rapid growth, and the stools throw up luxuriant suckers, I shall soon have young thrifty trees, which can be more certainly preserved from the attacks of the insects, should they again visit them; for trees, which are so large as to have very rough bark, supply so many fastnesses for the deposition of the eggs, and to cover the labour of the worms, that it is very difficult to extirpate them.

If this course was pursued generally, and at the same season of the year, by such persons as have locust trees on their estates, I believe the insects would be exterminated, as I do not find that they visit any other tree, and in a few years we should have healthy and vigorous groves of this pride of the forest.

It is not many years since the history of the canker-worm was promulgated, and we are indebted to Professor Peck, for that valuable information, which has led to the discovery of various means to prevent their ruinous assaults on the orchard; may it not then be sanguinely anticipated, that the combined efforts of those, who are solicitous to advance the best interests of the nation, will ultimately enable the owners of woodlands and cultivated groves to bid defiance to the noiseless dilapidations of this destructive insect.

With grateful acknowledgments for your exertions, to foster and advance the science of agriculture, I am, sir,

Your obedient servant,

H. A. S. DEARBORN.

ON THE FORM OF ANIMALS. BY HENRY CLINE, Esq.
Surgeon.

[From the Publications of the Board of Agriculture, England, Vol. IV.]

THE form of domestic animals has been greatly improved by selecting with much care, the best formed for breeding ; but the theory of improvement has not been so well understood, that rules could be laid down for directing the practice. There is one point particularly, respecting which the opinions of breeders have much varied, which is, whether crossing the breed be essential to improvement.

It is the intention of this communication to ascertain in what instances crossing is proper, and in what prejudicial ; and the principles upon which the propriety of it depends.

It has been generally supposed that the breed of animals is improved by the largest males. This opinion has done considerable mischief, and would have done more injury if it had not been counteracted by the desire of selecting animals of the best form and proportions, which are rarely to be met with, in those of the largest size.

Experience has proved that crossing has only succeeded in an eminent degree, in those instances in which the females were larger than in the usual proportion of females to males ; and that it has generally failed when the males were disproportionally large.

The external form of domestic animals has been much studied, and the proportions are well ascertained. But the external form is an indication only of internal structure. The principles of improving it must therefore be founded on the knowledge of the structure and use of internal parts.

The lungs are of the first importance. It is on their size and soundness that the health of an animal principally depends. The power of converting food into nourishment, is in proportion to their size. An animal with large lungs, is capable of converting a given quantity of food into more

nourishment than one with smaller lungs, and therefore has a greater aptitude to fatten.

The Chest.

The external indication of the size of the lungs is the form and size of the chest; the form of which should have the figure of a cone, having its apex situated between the shoulders, and its base towards the loins.

The capacity of the chest depends upon its form more than on the extent of its circumference; for, where the girth is equal in two animals, one may have much larger lungs than the other. A deep chest therefore is not capacious unless it is proportionally broad.

The Pelvis.

The pelvis is the cavity formed by the junction of the haunch bones with the bones of the rump. It is essential that this cavity should be large in the female, that she may be enabled to bring forth her young with less difficulty. When this cavity is small, the life of the mother and of her offspring is endangered.

The size of the pelvis is chiefly indicated by the width of the hips and the breadth of the *twist*, which is the space between the thighs.

The breadth of the loins is always in proportion to that of the chest and pelvis.

The Head.

The head should be small, by which the birth is facilitated. Its smallness affords other advantages, and generally indicates that the animal is of a good breed.

Horns are useless to domestic animals. It is not difficult to breed animals without them. The breeders of horned cattle and horned sheep, sustain a loss more extensive than they may conceive; for it is not the horns alone, but also much more bone in the skulls of such animals to support their horns; besides there is an additional quantity of ligament and muscle in the neck which is of small value.

The skull of a ram with its horns, weighed five times more than another skull which was hornless. Both these skulls were taken from sheep of the same age, each being four years old. The great difference in weight depended chiefly on the horns; for the lower jaws were nearly equal, one weighing seven ounces, and the other six ounces and three quarters; which proves that the natural size of the head was nearly the same in both, independent of the horns and the thickness of the bone which supports them.

In a horned animal the skull is extremely thick. In a hornless animal it is much thinner; especially in that part where the horns usually grow.

To those who have not reflected on the subject, it may appear of little consequence whether sheep and cattle have horns; but on a very moderate calculation it will be found, that the loss in farming stock, and also in the diminution of animal food, is very considerable, from the production of horns and their appendages. A mode of breeding which would prevent the production of these, would afford a considerable profit in an increase of meat and wool, and other valuable parts.

The length of the neck should be proportioned to the height of the animal, that it may collect its food with ease.

The Muscles.

The muscles and tendons, which are their appendages, should be large; by which an animal is enabled to travel with greater facility.

The Bones.

The strength of an animal does not depend upon the size of the bones, but on that of the muscles. Many animals with large bones are weak, their muscles being small. Animals that were imperfectly nourished during growth, have their bones disproportionately large. If such deficiency of nourishment originated from a constitutional defect, which is the most frequent cause, they remain weak during life. Large bones, therefore, generally indicate an imperfection in the organs of nutrition.

On the improvement of Form.

To obtain the most approved form, two modes of breeding have been practised ; one, by the selection of individuals of the same family ; called *breeding in-and-in*. The other by selecting males and females from different varieties of the same species ; which is called *crossing the breed*.

When a particular variety approaches perfection in form, breeding in-and-in may be the better practice ; especially for those not well acquainted with the principles on which improvement depends.

When the male is much larger than the female, the offspring is generally of an imperfect form. If the female be proportionally larger, the offspring is of an improved form. For instance, if a well formed large ram be put to ewes proportionally smaller, the lambs will not be so well shaped as their parents : but if a small ram be put to larger ewes, the lambs will be of an improved form.

The proper method of improving the form of animals, consists in selecting a well formed female, proportionally larger than the male. The improvement depends on this principle, that the power of the female to supply her offspring with nourishment is in proportion to her size, and to the power of nourishing herself from the excellence of her constitution.

The size of the foetus is generally in proportion to that of the male parent ; and therefore, when the female parent is disproportionately small, the quantity of nourishment is deficient, and her offspring has all the disproportions of a starvling. But, when the female, from her size and good constitution, is more than adequate to the nourishment of a foetus of a smaller male than herself, the growth must be proportionately greater. The larger female has also a greater quantity of milk, and her offspring is more abundantly supplied with nourishment after birth.

To produce the most perfect formed animal, abundant nourishment is necessary from the earliest period of its existence, until its growth is complete.

It has been observed, in the beginning of this paper, that the power to prepare the greatest quantity of nourishment, from a given quantity of food, depends principally upon the magnitude of the lungs, to which the organs of digestion are subservient.

To obtain animals with large lungs, crossing is the most expeditious method ; because well formed females may be selected from a variety of a large size, to be put to a well formed male of a variety that is rather smaller.

By such a method of crossing, the lungs and heart become proportionately larger, in consequence of a peculiarity in the circulation of the foetus, which causes a larger proportion of the blood, under such circumstances, to be distributed to the lungs than to the other parts of the body ; and as the shape and size of the chest, depend upon that of the lungs, hence arises the remarkably large chest, which is produced by crossing with females that are larger than the males.

The practice according to this principle of improvement, however, ought to be limited ; for, it may be carried to such an extent, that the bulk of the body might be so disproportioned to the size of the limbs as to prevent the animal from moving with sufficient facility.

In animals, where activity is required, this practice should not be extended so far as in those which are required for the food of man.

On the Character of Animals.

By character in animals is here meant, those external appearances by which the varieties of the same species are distinguished.

The characters of both parents are observed in their offspring ; but that of the male more frequently predominates. This may be illustrated in the breeding of horned animals ; among which there are many varieties of sheep, and some of cattle, that are hornless.

If a hornless ram be put to a horned ewe, almost all the lambs will be hornless ; partaking of the character of the male rather than of the female parent.

In some counties, as Norfolk, Wiltshire, and Dorsetshire, most of the sheep have horns. In Norfolk the horns may be got rid off by crossing with the Ryeland rams ; which would also improve the form of the chest and the quality of the wool. In Wiltshire and Dorsetshire, the same improvements might be made by crossing the sheep with South Down rams.

An offspring without horns might be obtained from the Devonshire cattle, by crossing with hornless bulls of the Gallo-way breed ; which would also improve the form of the chest, in which, the Devonshire cattle are often deficient.

Examples of the good effects of Crossing the Breed.

The great improvement of the breed of horses in England arose from crossing with those diminutive Stallions, Barbs, and Arabians ; and the introduction of Flanders Mares into this country was the source of improvement in the breed of cart horses.

The form of the swine has also been greatly improved, by crossing with the small Chinese boar.

Examples of the bad effects of Crossing the Breed.

When it became the fashion in London to drive large bay horses, the farmers in Yorkshire put their mares to much larger stallions than usual, and thus did infinite mischief to their breed, by producing a race of small chested, long legged, large boned, worthless animals.

A similar project was adopted in Normandy, to enlarge the breed of horses there by the use of stallions from Holstein ; and, in consequence, the best breed of horses in France would have been spoiled, had not the farmers discovered their mistake in time, by observing the offspring much inferior in form, to that of the native stallions.

Some graziers in the Island of Sheppey, conceived that they could improve their sheep by large Lincolnshire rams, the produce of which, however, was much inferior in the shape of the carcase, and the quality of the wool ; and their flocks were greatly injured by this attempt to improve them.

Attempts to improve the native animals of a country, by any plan of crossing, should be made with the greatest caution ; for, by a mistaken practice extensively pursued, irreparable injury may be done.

In any country where a particular race of animals has continued for centuries, it may be presumed that their constitution is adapted to the food and climate.

The pliancy of the animal economy is such, as that an animal will gradually accommodate itself to great vicissitudes in climate and alterations in food ; and by degrees undergo great changes in constitution ; but these changes can be affected only by degrees, and may often require a great number of successive generations for their accomplishment.

It may be proper to improve the form of a native race, but at the same time it may be very injudicious to attempt to enlarge their size.

The size of animals is commonly adapted to the soil which they inhabit ; where produce is nutritive and abundant, the animals are large, having grown proportionally to the quantity of food which for generations, they have been accustomed to obtain. Where the produce is scanty, the animals are small, being proportioned to the quantity of food which they were able to procure. Of these contrasts the sheep of Lincolnshire and of Wales are examples. The sheep of Lincolnshire would starve on the mountains of Wales.

Crossing the breed of animals may be attended with bad effects in various ways ; and that, even when adopted in the beginning on a good principle ; for instance, suppose some larger ewes than those of the native breed were taken to the mountains of Wales and put to the rams of that country ; if these foreign ewes were fed in proportion to their size, their

lambs would be of an improved form, and larger in size than the native animals ; but the males, produced by this cross, though of a good form, would be disproportionate in size to the native ewes ; and therefore, if permitted to mix with them, would be productive of a standing ill-formed progeny. Thus a cross which, at first, was an improvement, would, by giving occasion to a contrary cross, ultimately prejudice the breed.

The general mistake in crossing has arisen from an attempt to increase the size of a native race of animals ; being a fruitless effort to counteract the laws of nature.

The Arabian horses, are, in general, the most perfect in the world ; which probably has arisen from great care in selection, and also from being unmixed with any variety of the same species, the males therefore have never been disproportioned in size to the females.

The native horses of India are small, but well proportioned, and good of their kind. With the intention of increasing their size, the India Company have adopted a plan of sending large stallions to India. If these stallions should be extensively used, a disproportioned race must be the result, and a valuable breed of horses be irretrievably spoiled.

From theory, from practice, and from extensive observation, which is more to be depended upon than either, it is reasonable to form this conclusion, that it is wrong to enlarge a native breed of animals ; for, in proportion to their increase of size, they become worse in form, less hardy, and more liable to disease.

Petersham, October 2, 1820.

[To the Corresponding Secretary.]

SIR,

SHOULD the following communication, respecting the preservation of fruit trees from decay and premature old age, appear to be entitled to notice, you will oblige by presenting it to the Trustees of the Society.

Several years ago I owned a tan yard on the bank of a pond, raised by a dam across a small rivulet, which passes through my farm in Petersham. Some of the tan, after it was taken from the vats, was occasionally thrown into the pond. I noticed from time to time, that the fish, in the pond, died. I was induced to believe, that some deleterious property in the tan produced the effect on the fish, and that it might be converted to some valuable use in agriculture.

At that time, from various causes, many of my fruit trees, and particularly my pear, peach, and plum trees, were in a state of decay. For the purpose of an experiment, I applied a small quantity of tan to the roots of my decayed trees ; the result exceeded my most sanguine expectations. The trees began to revive, and the next season I made a similar and more extensive use of my tan about my fruit trees ; and the result has been obvious in all, but more particularly in my pear, peach, and plum trees, which are the most liable to decay in this section of the county.

Tan about the roots of trees, loosens the earth, and prepares it to receive and communicate greater quantities of nutriment to the trunk and branches. The tree is thereby invigorated, and acquires more strength to resist any disease, by which it may be attacked. But the most beneficial effect of the use of tan is to prevent the approach of all kinds of insects, which prey upon the very life of the tree. My fruit trees, which have been prepared with tan, have been wholly free from the ravages of caterpillars, canker-worms, grubs, and every kind of insects ; while others, which stand near by, and which have been neglected, have been more or less injured by these common nuisances, *too common* in fruit orchards, through the careless neglect of the husbandman. Tan also prevents the black gum from oozing from the trunks and branches of fruit trees ; which is more frequently the case in damson, plum, and peach trees, than in any other, arising from the constitutional weakness of the tree, or from some other cause, which is prevented by the application of tan.

This was the state of my trees, and of those of my neighbours, before I made the experiment by using tan. The result is obvious and notorious to all, who examined the trees at the different periods. My trees are healthy and flourishing and vigorous, while those of my neighbours, who have neglected the use of tan, are either dead or in the last stages of decay. My fruit has not only been greatly increased in size and quantity, but its flavour has been much improved and enriched.

A remarkable instance of the wonderful effect of tan in restoring decayed fruit trees to health and vigour is observable in a pear tree, which stands in my garden. Six or seven years ago it was almost lifeless. It had but one or two small green branches on it ; the rest were entirely dead and dry. I was induced to try the effect of tan upon it, but with little hope of success. In the course of two or three years I was astonished to see new branches shoot out from its trunk ; and it is now the most flourishing fruit tree on my farm. This fact can be attested by hundreds.

It has generally been my practice to renew the tan about the roots of my trees once in two years. It may possibly be expedient to renew it annually, as soon as the snow has been dissolved from the roots. I have usually appropriated from half a bushel to two bushels to each tree, according to its size. It may be carelessly placed around the trunk of the tree ; and it will soon spread itself to a proper distance over the roots.

I feel the most perfect conviction of the sure and certain effect of tan in restoring decayed fruit trees to health and preserving them to vigour. Should any one, however, entertain doubts, the experiment may be easily made, with trifling expence, particularly by those who live in the neighbourhood of tan yards. Tan has been esteemed useless, after it has been thrown aside by the tanner. Any one, who will ask, may receive without fee or reward.

JOHN GATES.

Petersham, October 2, 1820.

We have seen and examined the fruit trees of Mr. Gates, a respectable farmer of this town. We are satisfied that his statement respecting the effect of tan, in restoring decayed fruit trees to health, and preserving them in a flourishing state, is correct. Mr. Gates has paid great attention, in improving his fruit trees, and we have no hesitation in saying, that we have no doubt that his discovery of the good effect of tan, will be most valuable to the community.

HUTCHINS HAPGOOD.
JARED WEED.

RUTA BAGA, OR SWEDISH TURNIP.

[We are induced to insert the following communication from the Hon. Mr. Pickering, which first appeared in the "American Farmer," not only because we have the highest respect for his opinions on agricultural subjects, but because Mr. Cobbett's work had an extensive circulation in this part of our country, and was calculated to produce an impression unfavourable to the culture of the potatoe.—The unexampled boldness of assertion, not supported by facts, which characterizes Mr. Cobbett's writings on all subjects, appears to us to demand a thorough examination of them. His violent prepossession in favour of the Ruta Baga, or Swedish Turnip, led him to undervalue the potatoe. It is not our design in inserting Col. Pickering's remarks to discourage the culture of the Swedish turnip, nor do we understand such to have been the scope of Col. Pickering's observations. The only purpose is to preserve to the potatoe cultivation, the degree of favour to which it is justly entitled. We have struck out the introductory remarks of Col. Pickering which were applicable only to the paper in which it was introduced.]

THE encomiums passed on the Ruta Baga by that extraordinary man William Cobbett, and his reprobation of potatoes, are perhaps equally extravagant. If there be truth in the

analysis of these two roots by Sir Humphrey Davy, the same weight of potatoes contains more than three times the quantity of nutritious matter that is found in the Ruta Baga. Yet if both be given in their *raw* state, to domestic animals, the latter may be found the better root. For human food, raw potatoes would be intolerable, while Ruta Baga is not unpalatable. Yet if both be equally well cooked, few can hesitate to give a decided preference to the potatoe, as well in regard to taste as nutrition. The potatoe, if a good and mealy kind, will well supply the place of bread. Its value in this respect, is satisfactorily ascertained in the British Isles, more especially in Ireland, where the practical judgment of that class of its population which makes the greatest use of potatoes, very well accords with Mr. Davy's analysis of grains and roots. He states that of a 1000 parts of wheat, 955 are nutritive ; and of potatoes, 200 to 260 parts. Now in a report to the English Board of Agriculture, in the year 1795, by an intelligent Irish gentleman, Samuel Hayes, Esq. it is stated "That the nourishment from one pound of good household wheat bread, is equal to five pounds of the *best sort* of potatoes." That this was first suggested to the "ingenious gentleman" Mr. Broughall, who gave the information to Mr. Hayes, "from a memoir on the subject by Mr. Parmentier, a French chemist ; and has since been supported by many corroborating circumstances. Mr. Broughall having observed, that whatever weight the shilling *household loaf* consists of in Dublin, five times that weight of *potatoes* may have been bought at that time for the same sum ; and if by any cause the price of potatoes should rise above that proportion with respect to bread, the lower class then decline the purchase of potatoes ; experience having taught them the cheapest mode of support." Mr. Hayes adds, "That as in the country parts of Ireland, the fowls, pigs and dogs come in for their share, (of potatoes) there is certainly more consumed than *five times* the quantity of *bread*, which might be necessary ; but it is far from *thrown away* ; the family by this

means eat none but the soundest and most palatable potatoes, whilst the refuse supply equally the wants of the other animals. We must also add, that another cause of increased consumption arises from the universal practice of allowing the little children of the house to roast potatoes for their own use, as often as they please, in the turf or wood ashes. As you ride by a cottage, you frequently see a group of children run to the door, each one holding in his hand a roasted potatoe ; and to this facility of procuring plenty of *wholesome sustenance*, at this stage of life, may be attributed *the robust health of our peasantry, and the great population of our country*. But according to Mr. Cobbett, the potatoe, when analysed, contains chiefly *dirt, water and straw* ; and seeing that Ruta Baga, according to Sir H. Davy's analysis, contains only 64 nutritive parts (while the potatoe contains 200 to 260) in a 1000, of what do the remaining 936 parts consist ? Doubtless *as truly* as the potatoe, of *dirt, water and straw*.

The common opinion of the injurious if not poisonous quality of the *juice* of the potatoe, is probably correct ; and will account for the often stated fact that raw potatoes will barely keep swine alive ; while the experience of many farmers will incontestably prove, that when boiled (the water in which they are boiled being thrown away) potatoes will greatly contribute to the growth and fattening of hogs. Even in their raw state, they are unquestionably useful in the fattening of cattle, and for increasing the milk of cows, while fed on hay or other dry fodder in winter. Probably, *raw* potatoes while full of juice, if useless or injurious to *swine* may be a *salutary food* for *cattle* ; certain it is, that the latter eat them voraciously, which is not the case with swine. Yet even swine will not only live but thrive upon them, when having been spread and dried until shrivelled, they are kept till after mid-summer of the year succeeding their growth. The juice of the root of one species of the Cassada, is poisonous ; but this being expressed, wholesome bread, much used in the West Indies, is then made of the roots.

Some sorts of potatoes must yield more nourishment than others ; and hence the difference in the results of Sir H. Davy's experiments in analysing them. The mealy and well flavoured potatoe might have that superiority over the watery and ill-flavoured. The same remarks will apply to other roots. Much also, as to their quantity of nutritive matter, may depend on the nature of the soil where roots of the same kind are raised. I once pulled a flat turnip of the common kind, weighing two pounds, from the deep rich soil at the foot of a hill, and another weighing only one pound from a dry gravelly loam ; both were boiled and mashed ; and when the watery juice of each was pressed out, the eye could not determine of which there was the greatest quantity ; both were well flavoured.

The potatoes of Nova Scotia and the remoter parts of the District of Maine, (like those from England and Ireland,) are vastly superiour to those generally raised in Massachusetts and the States still further south. It is the common opinion that potatoes require a dry (and consequently a warm) soil. This, as to the United States in general, is doubtless an error. Ireland and the west of England are moist and cool countries ; and from them have usually come the best potatoes. In all but the most northern portions of the United States, it would seem advisable to choose moist and cool grounds, with northern aspects, for raising potatoes, at least for the table: Dr. Anderson, if I mistake not, somewhere mentions a very dry summer in Great Britain, when the potatoe crops were small in quantity, and the roots of very ordinary quality. The next summer was amply moist, and then the potatoes were abundant in quantity and of excellent quality.

My own observation and experience have satisfied me, that, generally speaking, potatoes improve in their quality when carried from a warmer to a colder climate ; and just the reverse happens when carried from one colder to a warmer. In the latter case, the produce of even the first year has generally borne hardly a resemblance to those

planted ; *these* were mealy and finely flavoured ; their produce moist and of different flavour. The best early potatoes I ever had, were produced from a handful of small ones brought from Maryland. It was in the third year that they attained their greatest excellence. They were afterwards confounded with others and lost, for want of my personal attention.

We have in Massachusetts a very productive potatoe, said to have been brought from the river Plate. It is a long red potatoe, which I have cultivated for a dozen years. I think it has been constantly improving in quality ; and has now become a good potatoe for the table, especially in the spring.

Of the same sorts of potatoes, individual roots are greatly superiour to others. Perhaps the proportion of the latter may be increased, (if thereby an entire crop cannot be obtained,) in the following way ; select the fairest roots of a large size, and plant them entire in hills, one potatoe in a hill. When the produce is ripe, boil two or three from each hill, carefully marking from what hills they were respectively taken, and save for seed the residue in the hills giving the best samples. This process, a few times repeated, may furnish potatoes of a uniformly good quality.

But to return to the Ruta Baga. Your correspondent "A Friend," refers the other "A Subscriber," to Mr. Barney's application of this root, in feeding his two fat oxen, as stated in the first number of the American Farmer. But what is found there ? That those extraordinary beeves were *fattened* on that root ? Just the reverse. It was Indian corn meal which improved and finished them so highly, and the Ruta Baga was used rather as a *condiment*, to give the oxen a better appetite for the meal. They were two years in fattening. The first winter they eat *equal quantities* of Indian meal and of the Ruta Baga ; but as the latter contains (according to Sir H. D.) only 64 nutritive parts in a 1000, while

Indian corn probably contains at least 900,* the meal contributed fourteen times as much nourishment as the Ruta Baga. In the second winter the difference was still greater ; the ox Columbus then eating daily from 12 to 16 quarts of meal, and only 3 to 12 quarts of Ruta Baga. And you mention that Mr. Barney “ gives the preference to Indian meal over every other species of food for fattening either sheep or cattle, and gives it in its dry unsifted state.” It has ever been the practice of farmers in New England, in stall-feeding cattle on hay and Indian meal, to give the latter in the same form. From American farmers, probably, Mr. Barney, an Englishman, learned that manner of using Indian meal.

You say also, that “ Mr. Barney concurs with Mr. Cobbett in the belief, that the Ruta Baga is sweeter and far more nutritious than any other root, or vegetable for feeding livestock.” But this is mere matter of *opinion*. Even to the taste, the parsnip, carrot, and every sort of beet, is manifestly sweeter ; and to decide practically the value of Ruta Baga, compared with other roots, in fattening cattle, more accurate experiments will be necessary than have been made by either. In the mean time, we may more confidently rely on the analysis of vegetables by so distinguished a chemist as Sir Humphrey Davy. He states, that the red beet contains 121 parts in a 1000, of saccharine matter or sugar—the white beet 119 such parts—parsnips 90, and carrots 95 ;

* “ In the last century, a professor of Chemistry in Italy, discovered that the meal of maize, (Indian corn) like the meal of wheat, contained not only starch, but a soluble mucilage or extract, and a glue of the same nature as animal matter.”

This is stated by Dr. Pearson, in his analysis of the potatoe root, communicated to the Board of Agriculture ; which, as well as Mr. Hayes' communication above mentioned, appear in a Report on the Culture and Use of Potatoes, published by the board in 1795. I wish some of our chemists would analyse the best sorts of Indian corn ; I am inclined to think this grain contains nearly or quite as much nutritive matter as wheat.

while the Ruta Baga contains no more than 51 such parts. The mangel wurtzel, or greater beet, is in taste like the red and white beets, and doubtless contains as much saccharine matter ; all of them more than double the quantity of nutriment that is afforded by the Ruta Baga ; and parsnips and carrots fifty per cent. more. On strong lands in England the mangel wurtzel yields currently 48 tons per acre. See Memoirs of the Philadelphia Society of Agriculture, Vol. III. Appendix p. 97, where the mode of culture is given, for the regular production of such immense crops. Of carrots, eighteen tons (upwards of 700 bushels, 56 lbs. to the bushel) have been raised on an acre in Massachusetts ; and these, as well as the mangel wurtzel, cattle eat with great avidity. For cows giving milk, both are to be preferred to the Ruta Baga, even if they gave no more nutriment. In the last autumn, the flavour of the butter was very much injured by my cows feeding plentifully on the neches and leaves (greens, as Mr. Cobbett calls them,) of the Ruta Baga.*

Conclusion.

Ruta Baga sown in June will yield great crops ; the seeds vegetate quickly, and the plants soon attain a size to admit of easy culture. The root is hardy, will endure severe cold, and keep till mid-summer of the year following their growth ; and are usefully applied for food to all domestic animals, cows giving milk probably to be excepted.

Mangel Wurtzel, cultivated in the same manner, and sown in April or early in May, will yield crops as large as the Ruta Baga ; individual roots growing to the weight of from 5 to 10 pounds. But the roots will not bear frost like the Ruta

* A late English writer (Bonnington Mowbray, Esq.) treating of the food for milch cows, says "Cabbages may be given *moderately*, but turnips (he probably means the common turnips) make thin milk and bad butter, in spite of all the nostrums which have been recommended as preventives." I fear the Ruta Baga will not be wholly free from the same objection.

Baga. It will be more easy to preserve them in winter, in the middle than in the northern states. The genuine mangel wurtzel is of a red colour : and when full grown, has more than half its body above ground.

Carrots being of smaller growth than either of the former roots, seem to require a different arrangement. Instead of one row on a ridge, I would sow two rows, ten or twelve inches apart ; and thin the plants to four or five inches distance in the row, with intervals of three feet between the double rows, for tilling them with the plough. In this manner, I entertain no doubt that twenty tons and upwards to the acre may be raised.

Both carrots and mangel wurtzel, being of much softer texture than Ruta Baga, are more easily chopped into pieces for cattle. It is generally understood that cows giving milk in winter, if fed plentifully with carrots, will produce yellow butter. Mr. Jefferson's authority may be adduced for stating, that the famous Parmesan cheese of Italy, receives its light yellow colour from the juice of carrots, mixed with the milk or curd. The flavour of American cheese has sometimes appeared to be injured by an excessive use of annatto ; the same colouring that has long been used in England. The practice doubtless originated in deception, to give that colour *artificially* which *rich milk* afforded of *itself*, a fine yellow. The practice in both countries is now continued from fashion. The Parmesan, according to Mr. Jefferson, is a two meal cheese, made of the night's milk skimmed, (the cream being taken off very early the next morning for making butter) and mingled with the new milk of the morning. It is not a fat cheese, and this accounts for it.

I am, Sir, your obedient servant,

T. PICKERING.

January 4, 1820.

CATTLE SHOW, EXHIBITION OF MANUFACTURES, AND PLOUGHING MATCH, AND PUBLIC SALE OF ANIMALS, AND MANUFACTURES, AT BRIGHTON, ON WEDNESDAY AND THURSDAY, THE TENTH AND ELEVENTH OF OCTOBER, 1821. TO COMMENCE AT NINE O'CLOCK, ON EACH DAY.

THE Trustees of the Massachusetts Society, for the Promotion of Agriculture, encouraged by the patronage of the Legislature of this State, intend to offer in Premiums, not only the sum granted by the Government for that purpose, but also the whole amount of the income of their own funds. They, therefore, announce to the public, their wish to have a Cattle Show, and Exhibition of Manufactures, &c. &c. at Brighton, on Wednesday and Thursday, the 10th and 11th, of October, 1821; and they offer the following Premiums:—

FOR STOCK.

For the best Bull, raised in Massachusetts, above one year old,	\$40
For the next best do. do.	25
For the best Bull Calf, from five to twelve months old,	15
For the next best do. do.	8
For the best Cow, not less than three years old,	40
For the next best do. do.	30
For the next best do. do.	20
For the best Heifer, from one to three years old, with or without calf,	15
For the next best do. do.	10
For the best Ox, fitted for slaughter, regard to be had to the mode and expense of fattening,	50
For the next best do. do.	40
For the next best do. do.	30
For the best pair of Working Cattle,	30
For the next best do. do.	25
For the next best do. do.	20
For the next best do. do.	15
For the next best do. do.	10

For the best pair of Spayed Heifers, not less than one year old, - - - - - \$25

For the best Spayed Sows, not less than four in number, and not less than five months old, - 20

The claimant to be entitled to either of these two last premiums, must state the mode of operation and treatment, in a manner satisfactory to the Trustees.

For the best Merino Wethers, not less than six in number, having respect to form and fleece, - - 20

For the next best do. do. do. do. - - - 10

For the best native Wethers, not less than six in number, do. - - - - - 10

For the next best do. do. do. - - - 5

For the best Merino Ram, do. - - - - 15

For the next best do. - - - - 10

For the best Merino Ewes, not less than five in number, do. - - - - - 20

For the next best do. do. do. - - - 10

For the best Boar, not exceeding two years old, do. 10

For the next best do. do. do. - - - 5

For the best Sow, - - - - - 10

For the next best do. - - - - 5

For the best Pigs, not less than two in number, nor less than four months old, nor more than eight, - 10

For the next best do. do. - - - 5

None of the above animals will be entitled to premiums, unless they are wholly bred in the State of Massachusetts.

No animal, for which to any owner one Premium shall have been awarded, shall be considered a subject for any future Premium of the Society, except it be for qualities different from those for which the former Premium was awarded.

Any of the above Stock, when raised and still owned at the time of exhibition, by the person who raised them, will entitle the claimant to an allowance of ten per

cent. in addition. But Sheep, to be entitled to any of the above Premiums, must be raised by the person entering them.

FOR AGRICULTURAL EXPERIMENTS.

To the person who shall raise the greatest quantity of winter Wheat on an acre, - - - - -	\$30
To the person who shall raise the greatest quantity of Indian Corn on an acre, not less than seventy bushels, - - - - -	30
To the person who shall make the most satisfactory experiment, to ascertain the best mode of raising Indian Corn, in hills, in rows, or in ridges; not less than half an acre being employed in each mode, in the same field, the quantity and quality both of land and manure to be equal and uniform in each mode; all to receive a cultivation requisite to produce a good crop, - - - - -	30
To the person who shall raise the greatest quantity of Carrots on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Potatoes on an acre, not less than five hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Parsnips on an acre, not less than four hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of common Beets on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Mangel Wurtzel on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Ruta Baga on an acre, not less than six hundred bushels, - - - - -	20

To the person who shall raise the greatest quantity of common Turnips on an acre, not less than six hundred bushels, - - - - -	\$20
To the person who shall raise the greatest quantity of Onions on an acre, not less than six hundred bushels, - - - - -	20
To the person who shall raise the greatest quantity of Cabbages on an acre, not less than twenty-five tons weight, - - - - -	20
To the person who shall introduce any Grass, not before cultivated in this state, and prove, by actual experiment, and produce satisfactory evidence of its superiority to any now cultivated, - - -	30
To the person who shall give satisfactory evidence on "Soiling Cattle," not less than six in number, and through the whole season, together with a particular account of the food given, and how cultivated, - - - - -	30
To the person who shall make the experiment of turning in green crops as a Manure, on a tract not less than one acre, and prove its utility and cheapness over any other manure, giving a particular account of the process, and its result, - - -	30
To the person who shall, by actual experiment, prove the best season and modes of laying down lands to grass, whether spring, summer, or fall seeding be preferable, and with or without grain on different soils, - - - - -	30
To the person who shall raise the greatest quantity of dry pease, on an acre, not less than thirty bushels, - - - - -	20
To the person who shall raise the greatest quantity of dry beans, on an acre, - - - - -	20
To the person who shall give proof of having produced the largest quantity of dressed flax raised on an half acre, - - - - -	20

To the person who shall take up in the season on his own farm the greatest quantity of good honey, and shall at the same time, exhibit evidence of superior skill in the management of bees	- - -	\$10
For the best cheese, not <i>less than</i> one year old, and not less in quantity than 100 pounds	- - -	10
For the next best do. do.	- - -	5
For the best cheese <i>less than</i> one year old,	- - -	10
For the next best do. do.	- - -	5
To the person who shall raise the greatest quantity of vegetables, grain, peas and beans excepted, for winter consumption of the stock on his own farm, and not for sale, having regard to the respective value of said vegetables as food, stating the expence of raising the same, and the best mode of preserving the same through the winter,	- - -	30
To the person who shall raise the greatest quantity of winter wheat on an acre,	- - -	30
To the person who shall raise the greatest quantity of spring wheat, on an acre,	- - -	30
To the person who shall prove to the satisfaction of the Trustees that his mode of rearing, feeding and fattening neat cattle is the best,	- - -	20
For the best Butter, not less than 50 lbs.	- - -	10
For the second best do. do.	- - -	5
For the best Sole Leather, not less than five sides,	- - -	10
For the second best do. do.	- - -	5
For the best dressed Calves Skins, not less than twelve in number,	- - -	10
For the second best do. do.	- - -	5
For the best five Barrels of superfine Flour, manufactured in the State of Massachusetts, from Wheat, raised in this state,	- - -	25

To entitle himself to either of the Premiums, under this head of Agricultural Experiments, the person claiming, must cultivate a tract of at least one acre in one piece, with

the plant or production for which he claims a premium ; and must state, in writing, under oath of the owner, and of one other person, (accompanied by a certificate of the measurement of the land, by some sworn surveyor,) the following particulars :

1. The state and quality of the land, in the spring of 1820.
2. The product and general state of cultivation and quantity of manure, employed on it the year preceding.
3. The quantity of manure used the present year.
4. The quantity of seed used, and of Potatoes the sort.
5. The times and manner of sowing, weeding, and harvesting the crop, and the amount of the product ascertained, by actual measurement, after the whole produce, for which a premium is claimed, and the entire expense of cultivation.

And in relation to all Vegetables, except Potatoes, Onions and common Turnips, the fair average weight of at least twenty bushels must be attested ; and if hay scales be in the town, in which raised, not less than three averaged cart loads must be weighed.

The claim under this head, together with evidences of the actual product, must be delivered, free of postage, to Benjamin Guild, Esq. Assistant Recording Secretary of this Society, on or before the first day of December next. The Trustees not intending to decide upon claims under the head of Agricultural Experiments, until their meeting in December.

FOR INVENTIONS.

To the person who shall invent the best, simplest, and least expensive Machine for Threshing Wheat, or any small Grains, mown as well as reaped - - -	\$75
To the person who shall use the Drill Plough, or Machine, and apply it most successfully to the cultivation of any small Grains or Seeds, on a scale not less than one acre, - - - - -	20

- To the person who shall invent the best Machine, for pulverizing and grinding plaster to the fineness of twenty-five bushels per ton, and which shall require no more power than a pair of Oxen or a Horse, to turn out two tons per day, and so portable that it can be removed from one farm to another without inconvenience, - - - - - \$30
- To the person who shall produce, at the show, any other Agricultural Implement of his own invention, which shall, in the opinion of the Trustees, deserve a reward, - - - - - 20

In all cases proof must be given of the work done by the Machine, before it is exhibited; and of its having been used and approved by some practical farmer.

FOR FOREST TREES.

- For the best Plantation of White Oak Trees, not less than one acre, nor fewer than one thousand trees per acre, to be raised from the acorn, and which trees shall be in the best thriving state on the first of September, 1823, - - - - - \$100
- For the best plantations of White Ash, and of Larch Trees, each of not less than one acre, nor fewer than one thousand trees per acre, to be raised from the seeds, and which trees shall be in the best thriving state on the first of September, 1823, - 50
- For the best Live Hedge, made of either the White or Cockspur Thorn, planted in 1820, not less than one hundred rods, and which shall be in the best state in 1823, - - - - - 50

FOR DOMESTIC MANUFACTURES.

- To the person or corporation, who shall produce the best specimen of fine Broadcloth, not less than 1 5-8th yards wide, exclusive of the list, 40 yards in quantity, and dyed in the wool - - - - - 30

For the second best do. do. do. - - - -	\$20
For the best superfine Cassimere, not less than 3-4 yards wide, nor less than 40 yards in quantity, -	15
For the second best do. do. do. - - - -	10
For the best superfine Sattinet, 3-4 yards wide, not less than 50 yards, - - - -	10
For the second best do. do. do. - - - -	6
To the person or corporation, who shall produce the best specimen of Cotton Cloth, manufactured in this State, not less than 50 pieces - - -	20
To the person who shall produce the best specimen of any other fabrics of cotton, manufactured in this State, in public factories, not less than 50 pieces -	20
In private families, not less than 5 pieces - - -	20

FOR HOUSEHOLD MANUFACTURES.

For the best Woollen Cloth, 3-4 wide, not less than 20 yards in quantity - - - -	\$12
For the second best do. do. - - - -	8
For the best double-milled Kersey, 3-4 yard wide, not less than 20 yards in quantity - - -	12
For the second best do. do. - - - -	8
For the best Coating, 3-4 yard wide, and not less than 20 yards in quantity - - - -	8
For the second best do. do. - - - -	6
For the best Flannel, 7-8 yard wide, not less than 45 yards in quantity - - - -	10
For the second best do. do. - - - -	7
For the best do. 4-4 yard wide Carpeting, not less than 30 yards in quantity, - - - -	15
For the second best do. do. - - - -	7
For the best 5-8 yard wide Stair Carpeting, not less than 30 yards in quantity, - - - -	10
For the second best do. do. - - - -	7
For the best pair of Blankets, not less than 8-4 wide and 10-4 long, - - - -	6
For the second best do. do. - - - -	4

For the best Woollen Knit Hose, not less than 12 pair in number, - - - - -	\$5
For the second best do. do. - - - - -	3
For the best Worsted Hose, not less than 12 pair in number, - - - - -	5
For the second best do. do. - - - - -	3
For the best Men's Half Hose, (woollen) not less than 12 pair in number - - - - -	4
For the second best do. do. - - - - -	2
For the best Men's Woollen Gloves, not less than 12 pair in number, - - - - -	5
For the second best do. do. - - - - -	3
For the best Linen Diaper, 5-8 yard wide, and not less than 30 yards in quantity, - - - - -	5
For the second best do. do. - - - - -	3
For the best 4-4 yard Diaper, (for table linen) not less than 30 yards in quantity, - - - - -	10
For the second best do. do. - - - - -	5
For the best specimen of Sewing Silk, raised and spun in this state, of good fast colours, not less than one pound, - - - - -	5
For the second best do. do. - - - - -	3
For the best Linen Cloth, (for shirting or sheeting) one yard wide, and 25 yards long, - - - - -	8
For the second best do. do. - - - - -	4

All the above Manufactures, except when of Cotton, must be of the growth and manufacture of the State of Massachusetts. And all Manufactures, when presented, must have a private mark, and any public or known mark must be completely concealed, so as not to be seen, or known by the Committee, nor must the Proprietors be present when they are examined; in default of either of which requisitions, the articles will not be deemed entitled to consideration or premium.

Animals, Manufactures, or Articles, may be offered for Premium at Brighton, notwithstanding they may have received a premium from a County Agricultural Society.

It is understood, that whenever, merely from a want of competition, any of the claimants might be considered entitled to the Premium, under a literal construction, yet if, in the opinion of the Judges, the object so offered is not deserving of any reward, the Judges shall have a right to reject such claims. Persons to whom Premiums shall be awarded, may, at their option, have an article of Plate, with suitable inscriptions, in lieu of money. Premiums will be paid within ten days after they shall be awarded.

That in any case in which a pecuniary premium is offered the Trustees may, having regard to the circumstances of the competitor, award either one of the society's gold or silver medals in lieu of the pecuniary premium annexed to the several articles.

That if any competitor for any of the society's premiums shall be discovered to have used any disingenuous measures by which the objects of the society have been defeated, such person shall not only forfeit the premium which may have been awarded to him, but rendered incapable of being ever after a competitor for any of the society's premiums.

All premiums not demanded within six months after they shall have been awarded, shall be deemed as having been generously given to aid the funds of the Society.

The Trustees of the Massachusetts Society for promoting Agriculture, hereby give notice, that they intend, on the second day of the Cattle Show, viz.: on the 11th day of October next, to give Premiums to the Owners and Ploughmen of the three Ploughs, which shall be adjudged, by a competent Committee, to have performed the *best work, with least expense of labour*, not exceeding half an acre to each Plough, and of such depth as the Committee shall direct. The team used, to be always such as is ordinarily used on his farm, for breaking up land, by the competitor, and to be an ox team.

First Plough, . . .	\$20	Second Plough, . . .	\$12
Ploughman . . .	10	Ploughman . . .	6
Driver,	5	Driver,	3

Third Plough	\$8
Ploughman	4
Driver	2

In each case, if there be no Driver, both sums to be awarded to the Ploughman.

The persons engaging in the Ploughing Match, must own their respective Ploughs and Cattle ; and the Ploughman, (if he be not the owner,) must be a man employed on the owner's farm.

The persons intending to contend for these Prizes, must give notice, in writing, to S. W. POMEROY, or GORHAM PARSONS, Esquires, of *Brighton*, on or before the third day of October, so that proper arrangements may be made for the purpose. No person will, on any consideration, be admitted without such notice. The competitors will also be considered as agreeing to follow such rules and regulations as may be adopted by the Committee, on the subject. The Ploughs to be ready to start at 9 o'clock, A. M.

The result of the last Ploughing Matches at Brighton, and the satisfaction expressed by so many of their agricultural brethren, will induce the Society to continue these Premiums annually, in connexion with the Cattle Show ; as an efficacious means for exciting emulation and improvement in the use and construction of the *most important instrument of Agriculture*.

Persons intending to offer any species of Stock for Premium, are requested to give notice thereof, either by letter, (post paid) stating the Article, or to make personal application to Mr. JONATHAN WINSHIP, at *Brighton*, on or before the 9th day of October, and requesting him to enter such notice or application ; so that tickets may be ready at nine o'clock on the 10th. No person will be considered as a competitor who shall not have given such notice, or made such application for entry, on or before the time above specified.

All articles of manufactures must be entered and deposited in the Society's rooms on Monday the 8th of October

and will be examined by the Committee on Tuesday the 9th, the day before the Cattle Show, and no person but the Trustees shall be admitted to examine them before the show. The articles so exhibited must be left till after the show, for the satisfaction of the public.

The applicants will be held to a rigid compliance with this rule relative to entries, as well as to the other rules prescribed.

The examination of every species of Stock, (except Working Oxen,) ~~and of Domestic and Household Manufactures,~~ will take place on the 10th; and the trial of Working Oxen, examination of Inventions, and Ploughing Match, on the 11th of October.

The Trustees also propose to appropriate, on the second day of the Cattle Show, their Pens for the public sale of any Animals, that have been offered for Premiums, and also of any others, that are considered by them, as possessing fine qualities; and their Halls for the public sale of Manufactures. Both sales to take place at half-past eleven o'clock, precisely. And for all Animals or Manufactures, that are intended to be sold, notice must be given to the Secretary, before ten o'clock of the eleventh. Auctioneers will be provided by the Trustees.

By order of the Trustees,

JOSIAH QUINCY,

Chairman of the Committee of Premiums.

January, 1821.

AGRICULTURAL INTELLIGENCE.

THE Hon. Mr. Quincy's remarks on soiling cattle have been suspended, owing to that gentleman's engagements in the Convention for the revision of the Constitution of Massachusetts, and to his occupations, which immediately succeeded in consequence of his election to the office of Speaker of the House of Representatives of Massachusetts. They will be resumed in our next number.

The continuation of the *review* of a treatise on agriculture, published at Albany, (a treatise since understood to be written by General Armstrong, late Minister of the United States to France) and also of the review of Mr. Hayward's work on horticulture, is postponed to our next number, in consequence of the necessary insertion of Mr. Sullivan's address, and of the proceedings at the Cattle Show and agricultural experiments offered for premium.

It is believed, that the successful efforts made by our farmers this year, together with the description of the methods employed to bring about such results, will be of more practical utility than any speculations, or remarks upon theoretical essays. Such instances of successful cultivation as we have now the opportunity of recording, will produce more conviction, and more powerfully excite our farmers and cultivators, than any reasoning or arguments which we could urge.

It will be seen, that we have nearly attained in every branch of culture, in single cases, the highest point to which the most celebrated cultivators of Great-Britain have arrived.*

We may now safely appeal to the agricultural gentlemen of the Southern States, and ask whether our soil and climate, hitherto held by them in great contempt, compared to their own fertile soil and more genial temperature, are not capable, with the aid of science and exertion, of equalling theirs in point of profitable production. Let them put the produce of an acre of Upland Cotton, which in most favorable years will produce not more than 300 lbs. valued at 15 cents per lb., or 45 dollars, against 110 bushels of Indian Corn, worth with us, (at 75 cents per bushel,) 82 dollars 50 cents, and the cost of raising, which is estimated by one cultivator at 9 dollars 50 cents, or if you please to double it, 19 dollars.—Is *their* cultivation cheaper? The same question may be applied to crops of potatoes, at 500 bushels per acre, worth 20 cents per bushel,—and to crops of 800 bushels of carrots, worth the same price per bushel.

We are persuaded that the premiums and the efforts of the various agricultural societies in our State, will, in a few years, greatly increase all our agricultural products, without enhancing the expense of cultivation, in a correspondent degree.

We are pleased to learn, that the Cattle Shows of Essex, Worcester, Middlesex, Hampshire and Berkshire, have this

* We would not be guilty of the extravagance of praise too common with us by intimating that our general state of improvement corresponds with the examples offered for premium. They only show the advantage of great attention and improved culture.

year afforded abundant evidence of the zeal of our cultivators and the improvement of our agriculture in all its branches. May they persevere successfully, without the smallest tincture of envy towards each other, but with as much emulation as possible. May their intercourse be perfectly free; but above all, may they all consider that to do the greatest possible good, it is not sufficient that they should make successful experiments, but that they should make them *known*, and our central publication offers them a convenient mode of disseminating the important truths which their experiments may have brought to light.

Donations to the Massachusetts Agricultural Society.

It gives us great pleasure to notice the several donations received by the Society within the past year. They are continually increasing, and demonstratively prove the great desire of improvement which prevails throughout our State. There is scarcely a citizen of intelligence of this State who is abroad, or placed in circumstances favourable to the acquisition of seeds or plants, which he thinks may be important, who remains forgetful of the interests of his native State. Many of the plants or seeds prove not to be adapted to our soil and climate—but this furnishes no reason for neglecting to send them. If one in a thousand shall prove useful, who can calculate its future value? If Sir Walter Raleigh, or whoever else was the introducer of the potatoe into Europe, had contented himself with saying, “This plant is very good in its native regions but cannot flourish in Europe,” what would not the world have lost?

April 1st, 1820, Col. Dabney, of Fayal, presented to the Society some onion seed, of approved quality.

On the same day, Israel Thorndike, Jr. Esq. some grass seeds, fiorina and lupinella, from Italy.

May 13, 1820, Hon. John Welles presented a variety of garden seeds from France.

On the same day Mr. John Mackay presented to the society a churn of a new construction.

June 10, Edward A. Newton, Esq. presented some seeds and bulbs for the use of the Botanic Garden, imported by him from the Cape of Good Hope.

Paunkinqua, a Chinese merchant of great distinction, presented to the Society two chests of tea.

Sept. 9, 1820. Captain Thomas Clements presented to the Society a barrel of lupinella seeds (the sainfoin) and also melon, onion, and cauliflower seeds, all from Italy.

Jan. 23d, 1821. Gen. John Coffin, of St. John, New-Brunswick, formerly of Massachusetts, presented to the

Trustees a fine formed beautiful and powerful stud horse, of the light cart breed, imported by him from England—an animal admirably adapted to increase the bone and strength of our native breed of horses.

The Trustees expressed to General Coffin their grateful sense of his valuable donation, and of the motives which induced him to present the animal to the Agricultural Society of his native State. They engaged to take the greatest possible care of it, and to endeavour to carry into effect as far as possible the objects proposed by the donor.

They voted to him the Society's gold medal, and elected him an honorary member of the society for life.

The following analysis of Indian Corn, by Dr. Gorham,* is (so far as we know) entirely new, and it would have been highly grateful to us, if it could have appeared first in our Journal, to which it seems to be more appropriate, than to the Medical work, in which it was first published. We should have inserted Dr. Gorham's experiments at large, if we had room for them, and we hope to be able to do it in a future number, if his consent, and that of the editors of the New-England Journal of Medicine and Surgery, can be obtained.

According to Dr. Gorham's analysis of Indian Corn it contains the following constituent parts. The Zeïne to which he refers, and of which he found 3 parts in 100, is in his view a substance, which "differs from all the known proximate principles of vegetables," and may be at present considered as peculiar to this plant. We refrain from saying more, till we can do him full justice by inserting his experiments at large.

	Common State.	Dry.
Water, - - - - -	9.00 -	0.000
Farina, or Starch, - - - - -	77.00 -	84.599
Zeïne, - - - - -	3.00 -	3.296
Albumen - - - - -	2.50 -	2.747
Gummy matter - - - - -	1.75 -	1.922
Saccharine matter - - - - -	1.45 -	1.593
Extractive matter - - - - -	0.80 -	0.879
Cuticle and Ligneous fibre - - - - -	3.00 -	3.296
	98.50	
Phosphate, Carbonate, and probably Sulphate of Lime, and Loss. }	1.50 -	1.648
	100.00 -	99.976

* Professor of Chemistry in the University at Cambridge.—It is a source of great pleasure to us to find the Professors of that seminary applying their learning to great public and practical uses.—It would seem that Indian Corn nearly approaches wheat in its value as food for animals.

MASSACHUSETTS

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[No. IV.]

ESSAYS ON FLAX HUSBANDRY. BY S. W. POMEROY, Esq.
First Vice-President of the Society.

ESSAY I.

THE great surplus and depressed prices of our chief agricultural products, render it necessary for the farmer to seek others upon which he may calculate for more profitable returns, or at least such as will constitute a division of his risk; with this view *Flax* may be presented as an item deserving particular consideration.

For twenty years preceding 1816, the annual export of *Flax Seed* from the United States, averaged but about 250 thousand bushels! When we were British colonies, with one fifth of the present population, and a territory under cultivation probably much less in proportion, there was exported in one year (1770) upwards of 312,000 bushels.* It is very obvious, that the causes of this decrease, so disproportionate to the increase of all other products of the soil, may be attributed to the introduction of vast floods of cotton fabricks and yarns, at prices (nominally) very low, and the unexampled demand for breadstuffs and other food, during the period referred to. The effect has been to place *flax farming*

* Pitkin's Statistical View.

so far in the back ground, as scarcely to attract the attention of agricultural societies, when engaged in promoting improved methods of cultivation for other crops; and also, it is feared, to curtail *household manufactures*, the extension of which, it will not be denied, is eminently conducive to the prosperity of an agricultural people. For although prudent farmers have usually a *small patch*, the object has been so inconsiderable as not to demand any particular care in its management, and a tolerable crop, which, in Europe is considered as certain as any they raise, is supposed in many sections of New-England to be the effect of chance, or, as it is termed, *good luck*.—We will not pretend that Flax was at any period in this country estimated as a profitable, though formerly a necessary crop. But it is presumed, such has been the acquisition of knowledge, and improvements in agriculture, and especially those branches of mechanical science connected with it, that an entire new view may be taken of Flax husbandry—that it may be made to enter into the agricultural system of the country much more extensively than heretofore, and possibly be ranked as a considerable, and not unprofitable staple. With these impressions I have devoted some attention to the subject, and shall submit such information as I have been enabled to collect from various authentic sources; together with some remarks and intimations, which, should they throw no light on the question, may promote enquiry, and induce others, possessing better qualifications and more experience, to pursue the investigation.

My attention was drawn to the present object, in consequence of viewing the manufactories of sail cloth at *Pater-son*, near the falls of the Passaic in New-Jersey, the last autumn: where I was informed that 6,000 bolts of Duck had been made for the NAVY, the year preceding, of a quality superior to what I was prepared to expect, and which is pronounced, by those experienced in nautical affairs, to be worth, for service, from 30 to 50 per cent. more than can-

was imported from Russia! Indeed the respectable and liberal proprietors of those establishments are entitled to great credit for the perfection of this article; it is presumed they have conformed to the particular stipulations of their contracts with the commissioners of the navy board, who in this instance, as in others, are conspicuous for their attention to those minute details so necessary to insure solidity and permanence to what pertains to that department. But the political economists, and perhaps some farmers of the United States, will be surprised when told, that "the *flax*, from which this sail cloth was fabricated, was *imported* from Ireland and the Baltic! that if a sufficient quantity of native growth, could have been procured (which was doubtful) it does not possess sufficient strength to make such canvas, as the navy board would, or ought to have been satisfied with!" The question occurs, What is the cause of this inferiority? It will not be pretended, we believe, that there is any inherent defect in the soil, or that the climate is uncongenial to its perfection. On the other hand it will be admitted that there is nothing so peculiarly favourable, as to require less attention and care in the cultivation, than is bestowed in those countries in Europe, where it forms an important agricultural staple, and where similar management would unquestionably produce the same effects: for, however plausible the prevalent opinion may be, that the inferiority of American flax is owing solely to the injudicious preparation by *dew rotting*, and we will grant it is one very prominent cause, still there are others, which will be noticed in the sequel, that may be considered as having a very powerful influence in deteriorating the *quality*, as well as lessening the product.

The common flax plant (*Linum Usitatissimum*) possesses habits more peculiar than any other within the range of our cultivation: and it may be useful in order to reconcile the farmer and to impress on his mind the importance of attending to those habits, to trace this plant to its native soil, or rather to the country where they were acquired by cultiva-

tion, for a vast series of ages—for it is not improbable that, like the *small grains*, its present appearance is essentially different from that in its indigenous state; but to which it seems to be returning, in some parts of our country, by gradations less imperceptible, than it may have originally advanced.

Linen is mentioned at a very early period of sacred history as the production ONLY OF EGYPT. The most ancient and credible author of profane history* speaks of its remote antiquity being peculiar to that country: and those writers, who treat of the fabulous ages, ascribe the culture of Flax and invention of spinning and weaving to Isis, a queen of Egypt; the *Ceres* of the *Greeks*, to whom they attribute the discovery of bread corn. But if there was any question on this point, the *habits* of the *Flax plant* denote its most natural soil to have been on the margin of a river annually inundated, subsiding exactly at the period of seed time, leaving an entire new soil, or, by forming new combinations, completely renovating the old, which soon becoming dry, mellow and friable at top—retaining, or having conducted by art, sufficient moisture at bottom, aided by copious dews to ensure its maturity, but never any rain or storms to beat it down! where could it have found such a location but on the banks of the Nile?† It has degenerated when transplanted to every other country, probably in proportion to the want of care and attention to assimilate the soil, and gratify that impatience of change, to which it has been so long habituated. Hence it is that Flax owes the reputation of being the most exhausting of all crops. Let us enquire to what extent it may be well founded.

Sir Humphrey Davy remarks, in his “8th lecture on agricultural chemistry,” that “it is proved by facts stated in his

* Herodotus, Euterpe. chap. 37. 105.

† The inundation of the Nile begins to decrease about the 20th September. The seeds are sown and the crops perfected while the sun is in the southern tropic.

7th lecture, that plants require different materials from the soil, and that particular vegetables require peculiar principles to be supplied to the land in which they grow." And "as a most remarkable instance of the power of vegetables to exhaust the soil of certain principles," he states "that Mushrooms are said never to rise in two successive seasons on the same spot."—He might have cited *Flax*, as another instance not less remarkable! These facts are further substantiated by the effect produced on the soil, where *old fruit trees* have grown, in retarding the progress of young trees of the same family or species; for instance, a young cherry tree, planted on the spot from which an old one had been dug up, will remain nearly stationary for a length of time with the highest cultivation; remove it to the spot that has been occupied by an old pear tree, and plant a young pear tree in its place, and both will immediately become as flourishing as if no tree had ever been produced on the land. Of this fact I have experienced the most complete demonstration *repeatedly* within the last twenty years. It is, moreover, well known to most farmers, that an *Apple Orchard* will not succeed on land that had before been occupied by one, but that cherry or peach trees will grow vigorously on such land.

From these premises very potent arguments might be drawn in favour of a regular rotation of crops and against summer fallows.—They are here introduced to shew, that although a single crop of Flax will so exhaust the soil of "certain principles," that a repetition cannot take place with any prospect of success, even with large quantities of manure, under a lapse of from four to eight years, according as "those materials" necessary to its growth may be more or less retained, or supplied, yet it does not follow that the soil is exhausted of the *food* necessary to promote the luxuriant growth of other plants! The soundness of this position is supported by the usual practice in Europe and this country, of sowing clover and grass seeds with Flax, which is considered not more exhausting, and a better pro-

tecting crop than Oats or Barley ; and it is probable the result may be similar if we extend the enquiry, but it is unimportant at present, for good husbandry will ever dictate that clover or grass should be the next course in rotation to Flax.

We necessarily look to Europe for instructions in Flax husbandry, and first turn to Ireland, where it was introduced in 1696, under the patronage of William the third, eight years after he left Holland to wield the British sceptre. "An able and impartial enquirer* computes that in less than forty years from that period, the home consumption and exportation of Linen, amounted annually to one million sterling," which, if we allow for the difference in the value of money, may be equal to ten millions of dollars at present, "and this from thirty thousand acres of land ; employing, in raising and manufacture, one hundred and seventy thousand persons." When this trade was in its infancy, the Dublin society was instituted for its promotion, and some years after published several tracts on the culture of Flax ; from which, and from the tour of Arthur Young in that country, we derive some important facts, yet upon the whole, less information is obtained that is applicable to the management in this country, than we were led to expect, owing to the minute subdivision of the land among the cultivators, (a cotter seldom occupying more than a quarter of an acre) the very great difference of climate, and, above all, the uncommon fertility of the soil, which Sir H. Davy, in his 4th lecture, attributes to the proximity of the rocky strata to the soil, in that moist climate. But Mr. Curwen, long a distinguished statesman in the British parliament, and who, as an agriculturist, ranks with Mr. Coke and Sir John Sinclair, made a tour throughout Ireland in 1813 "with views directed to its agriculture and rural population," and to investigate the cause of the misery and degradation of that noble spirited, generous, but mismanaged people, remarks, that "he does not think the causes assigned by Sir H. Davy for this supe-

* See Campbell's Political Survey.

rior fertility are at all satisfactory," that those demi-tints, which in England distinguish lands that are exhausted, are in Ireland almost unknown; the verdure is everlasting and luxuriant, arising, as he should suppose, from some inherent quality of the soil, which keeps it in a proper state to admit the salutary influences of the atmosphere; that the richness of the surface resists all the efforts of man to sterilize it," and he gives the Irish credit for being very persevering in their endeavours for that purpose.* Notwithstanding this extreme fertility, Mr. Curwen says that the Flaxseed raised in Ireland was supposed to produce inferior plants, and that the Linen board of the Dublin society took charge of the importation of foreign Flaxseed for the supply of those who could not otherwise obtain it. This information relates to one of the most important features in flax farming, CHANGE OF SEED, which will be considered in our next essay.

ESSAY II.

CHANGE OF SEED.

NOTWITHSTANDING it is an opinion well established among experienced Flax growers in this country, that a change of seed is advantageous, it is apprehended that they are not aware of the extent of the benefit to be derived by selecting seed from a soil or climate essentially different; and it may be owing to a want of attention in this particular that the flax crops are so uncertain, and the quality inferior, however perfect in other respects the system may be conducted. Mr. Young observes, that "Foreign flaxseed was universally used in Ireland, when it could be obtained, otherwise they were careful to procure seed which grew upon a soil of an opposite quality from that which was to be sown," that "American seed was preferred, and produced finer Flax

* Observations on the state of Ireland, by J. C. Curwen, Esq. M. P. London, 1818.

than any other. Baltic seed produced more, but of a coarser quality." It is well known that American seed always bears the highest price in the Irish market.

We next look to *Flanders*, where flax was cultivated at a period as early as the commencement of the christian era.* Fortunately we are furnished with "directions for cultivating flax after the Flanders method" published by commissioners and trustees appointed by the British parliament to promote the linen trade in Scotland, at the head of whom was the celebrated Lord Kaims: From this *high authority* we find that it was the practise "to sow seed imported from Riga, if it could be obtained, otherwise the produce of Riga seed sown in Holland, and if that could not be had, that which Riga seed had produced in their own country, being careful to choose that which had grown on soils of a different texture and quality. What is the practice in Germany, where the cultivation is very extensive? By a respectable British publication, now before me,† in which an account is given of the trade of Stettin, a city of Prussian Pomerania, situated at the mouth of the river Oder, it appears that the extent of the linen trade is estimated by the quantity of Flax-seed *imported*; and it is stated that on an average of ten years preceding 1796, twenty-one thousand, six hundred and forty-five tons of Flax-seed were annually imported into that port "to be sent up the Oder and the waters connected with it, which, at forty bushels to the ton, amounts to upwards of eight hundred thousand bushels! sufficient for half a million of acres at the rate it is sown in this country! and it is not improbable that large quantities are imported into other ports connected with the large German rivers.

Foreign Flax-seed was sought after even in the remote vallies of Switzerland, as appears by the following extract from a treatise on the culture of Flax by Mr. Tschiffeli,

* Pliny's Nat. Hist : Book 19.

† Commercial & Agri. Mag. vol. iii. 1800.

president of the economical society of Berne. "In general the best flax seed is produced on strong soils and in cold climates. Experience has long convinced us that what is brought from Livonia" (Riga seed) "is to be preferred to all others, but when this cannot be procured, we must make use of that which grows on our own mountains, for instance Gessenai, Jura," &c.

A Flemish colony first settled the island of Fayal, and introduced Flax. They have become amalgamated with the Portuguese, but the culture, and manufacture of linen in families, has continued to an extent nearly equal to the cloathing and general consumption of a very dense population. The soil is mostly in tillage, and from its elevation admits of a variety of aspect and temperature, and great care is bestowed on the culture of *Flax*. I have been informed by Mr. Dabney, the United States consul for the Azores, who has resided fifteen years at Fayal, that in several instances, American seed, obtained from ships bound to Ireland, arriving in distress, has been sown; and the product, in *flax* and *seed*, has been fifty per cent. more than from that of native growth by the side of it! We have no information to this point from Russia or Italy; but it is believed that examples enough have been cited to shew the importance attached to this branch of the system in Europe, and to justify the conclusion that in this country a continued, judicious change of seed will be indispensable to the successful prosecution of flax husbandry; and a further inference may be drawn, that experiments on various soils from seed the growth of different climates, are requisite to direct the farmer to the quarter from whence his best seed may be obtained. Here opens a legitimate field for our numerous agricultural societies to labour in; on their exertions the farmer must depend in the outset; but let it once be ascertained that Riga seed is best in one section, Dutch or German in others, and mercantile *interest*, if not patriotism, will soon distribute them.

Should it be objected to importing seed on account of the expense, we reply, that large quantities of linseed oil are constantly imported, and the difference of price between our own seed and that imported, will not much exceed what is now paid for good clean seed for sowing or export, and that which is sold for crushing; but if it is fifty cents per bushel, or more, it can be no object, compared with the advantages that may be reasonably expected to result, and the farmer need not be told, that, "in all his operations, *parsimony* is never so ill judged, as when exercised in the selection of his seeds." It is not pretended, however, but that, from the great variety of soil and climate in the United States, the object in view might be obtained without importations; yet, it may be important to have a good stock to begin with, when trials could be instituted with its produce; at any rate it cannot be expected that individuals will embark in such a course of experiments, either with foreign or domestic seed, unless encouraged by agricultural societies or other public bodies.

SOILS.

The subject presents a character of such national importance, that a wider range must be taken than views of mere local interests require; we shall therefore first examine, under the present head, the different sections of our country. *New soils* are found most favourable to the growth of the flax plant; and it is scarcely necessary to mention the vast fertile tracts on the *western waters*, as capable of producing immense quantities.

The State of Maine has a soil and climate, that appears highly congenial to flax culture. The extensive tracts of strong carbonaceous soils, particularly those denominated "*black lands*," and the almost total absence of drought, will enable that state to possess a staple in this article, not inferior in value to any, except grazing, whenever the energies of her population shall be directed to it. The rest of New England, that part of New-York not included in the first

description, and New-Jersey, have bodies of land suitable for flax, quite sufficient to be embraced in the system of agriculture best adapted to their situation. Pennsylvania probably grows more flax than all the other states in the union.* The Atlantic sections of the states, south of the Delaware to the cotton latitude, possess considerable tracts of alluvial soils, bordering on the numerous rivers, creeks, bays and inlets, with which they are intersected; a portion of them, besides swamps, may be reclaimed without great expense; they have also bodies of strong clays. Should these be too much exhausted by severe cropping, they may soon be restored by the admirable clover system adopted by Col. Taylor of Virginia, and made to produce good flax; as it is probable, from the early period the ground may be sown, that the crop would be seldom injured by the droughts, to which the climate is subject.

The soils which rank first in this country are the fat bottoms, that are covered by the fall and spring floods which subside early enough in the season to get in a crop; those river flats on the second banks, that have a depth of strong alluvial soil; the reclaimed marshes and swamps with a black unctuous soil, not too peaty, with as much clay in the composition as will permit its being rendered soon dry and mellow, and not retain water on or near the surface; if it stands two feet below, so much the better, but must be well guarded by ditches and dykes against sudden freshets. Such is the soil of the province of Zealand, where more flax is raised, and of better quality, than in any other part of Holland. The next in estimation are the strong black loams on clay or hard pan, that will retain moisture. Yellow loams, with a holding subsoil, may be rendered suitable for flax by proper cultivation; and since the discovery that plaster of

* By the returns of the Marshals in 1810, there was manufactured in the United States \$300,000 worth of *Linseed Oil*; \$500,000 of which was made in Pennsylvania, and \$200,000 in New-England.—See Cox's Statement.

paris is an excellent manure for it, a crop may be obtained with much more certainty on lighter lands than formerly. Perhaps the characteristic of best *garden mould* may be applied to a flax soil, viz. *retaining sufficient moisture, and all that falls, without ever being saturated*; but on any soils the surface should be completely pulverized, and never worked when wet.

MANURES.

No dung should be applied to the land when the flax is sown, but may be put on bountifully with the previous crop. The objection is, that dung forces the growth so rapidly that the plants draw up weak, have a thin harle, and are more liable to lodge. Lime, marle, shells, leached ashes, &c. do not produce such effects. *Top dressings*, soon after the plants appear, of plaster, ashes, soot, &c. are highly beneficial, as they not only encourage the growth, but are a protection against *worms* which sometimes attack the young plants, and may be considered the only enemy they have, except weeds.

Salt has been mentioned by the late Dr. Eliot, of Connecticut, as an excellent manure to plough in with flax at the rate of five bushels to the acre;* probably more would be better. Plaster is now much used in Dutchess county, the best cultivated district in New-York, as a manure for flax, on which its good effects are as apparent as on corn.

The late chancellor Livingston viewed a piece of flax on the 20th of May, 1791, belonging to a poor tenant, very injudiciously sown on a dry sandy declivity, it looked so extremely sickly that the tenant thought of ploughing it up; the chancellor gave him three bushels of *Plaster*, which was sown the next morning before the dew was off, and had the satisfaction of seeing his tenant gather more flax from this half acre in an uncommon dry season, than was produced from any acre in the neighbourhood.†

* See Eliot's Essays on field husbandry.

† Transactions of Agr. Soc. New-York.

PREPARATION OF THE LAND.—It is not unfrequent in Ireland to obtain crops of flax from green sward, on which they put lime, shells, limestone gravel, &c. and break up in the fall, cross ploughing and harrowing fine in the spring; but it most commonly succeeds a crop of potatoes which receive the manure. In Flanders, *Hemp* was formerly more used as a preparation for flax than since the introduction of potatoes. In Italy it commonly precedes flax, and although the land gets no tillage, as the hemp is well manured it grows strong, and is then a powerful destroyer of weeds. In England, on some of the *fen soils* of Lincolnshire, &c. the usual course is *hemp* two or three years in succession, well manured, then flax without manure; a crop of *turnips* is often taken the same season after the *flax*, and *hemp* succeeds again. In Russia it is said that extensive crops of *flax* are drawn from new cleared lands after burning them over, and harrowing in the seed with the ashes. The best preparatory crops in this country, at present, appear to be *potatoes*, *corn* and *roots*; they will most generally repay the extra manure, and if well managed check the production of weeds.

The following *rotations* may serve as an outline subject to be varied, and *hemp* or other crops introduced as circumstances require, viz.

No. I. LOW, COLD OR RECLAIMED SOILS.

- 1st year. *Potatoes*.
- 2d do. *FLAX* with seeds.
- 3d do. *Herds grass* and *red top* or *tall meadow oat grass*, to continue three years or more, and the course repeated.

No. II. STRONG UPLANDS.

- 1st year. *Potatoes* or *Corn*.
- 2d do. *Corn* or *Roots*.
- 3d do. *FLAX* with seeds.
- 4th do. *Clover*.
- 5th do. *Orchard Grass* or *Herds Grass*, to continue three years or more.

No. III. LIGHT LANDS.

1st year. *Potatoes or Corn.*

2d do. *Corn or Roots.*

3d do. *FLAX with clover seed.*

4th do. *Clover*, to be mown once the after growth to be turned in and *Rye* sown thick on the furrow, which may be soiled or fed in the spring by sheep or milch cows, and ploughed in for

5th year. *Corn.*

6th do. *Spring Wheat or Barley.*

7th do. *Clover* and the course to be pursued as before, when flax will occupy the land every seventh year. In all cases, except when hemp is substituted, the tillage crops should receive the dung.

If the land is ploughed into beds, or convex ridges like turnpike roads about a rod wide, especially if low and level, the crop will be much more secure from injury by heavy rains, and the grass crops will be better if it remains in that form. On any soils, fall ploughing in narrow ridges will facilitate its early working in spring, and should not be dispensed with.

ESSAY III.

WEEDING is considered in Europe, and by good husbandmen in this country, as necessary to secure a good crop of flax, which is a very tender plant when young, and more easily checked in its progress by weeds than any other. It is not supposed to be injured by the clover and grass sown with it: on the contrary the *Flemish farmers* think them beneficial, by protecting the tender roots from drought, and keeping the weeds under. It should be carefully wed when the plants are three or four inches high; they are not then injured by the labourer going barefooted over them.

CHOICE OF SEED.

That of the last years growth should be obtained if possible. The usual marks of good seed are, that it be plump,

oily and heavy, of a bright brown colour, sinking readily in water, and when thrown into the fire to *crackle* and *blaze* quick. A very simple method of trial is to sprinkle it thin between two pieces of wet paper, which plunge in a hot-bed or dunghill, and in less than twenty-four hours the proportion that will vegetate can be discerned, which should be ascertained in order to regulate the

QUANTITY TO BE SOWN.

On this head no particular directions can be given, as it depends on the various qualities of soil, goodness of seed, &c. The rule for seeding small grains is *reversed*; flax requiring to be sown thickest on rich soil, as not more than one stalk is wanted from a plant. In England and Scotland, never less than two, or more than three bushels to the acre is sown. Two and an half is the most usual portion. In Flanders and Ireland seldom less than three bushels are sown, except when seed is an object. Thick sowing is to obtain fine flax. In this country it will be important, at present, to sow at such a rate as will insure good crops of each; and experience only can determine the exact point.

If sown very thin, too many lateral branches will be thrown out; each producing a boll or pod affording more seed, but shorter and inferior flax. If sown too thick, the plants will draw up *weak*, with a single boll on a plant, and, subject as our climate is to heavy showers and thunder gusts, very liable to lodge; one of the greatest dangers a flax crop has to encounter. The commissioners for promoting flax culture in Scotland, considered it as practicable, and strongly recommended that the system should be so conducted, as to obtain good flax and good seed at the same time. It is so viewed in Ireland, among the more extensive cultivators, except when wanted for *fine linen*, *cambrick*, *lawn*, &c. Dr. Deane, in the "New-England Farmer," a work of great merit published some thirty years since, when flax culture was more attended to than at present, recommends from *six* to *seven* pecks. It is probable that *six* pecks is the least, and *two* bushels the extent that should be sown to obtain the

most profitable results, till the demand for seed is considerably lessened.*

SOWING.

The seed should be got in as early as it is possible to prepare the ground. Dr. Deane observes that a slight frost after the plants are up will not injure them. For no crop is it more important that the seed should be equally distributed. Fortunately what has long been a desideratum is now attained. A machine for sowing *small seeds broad cast*, with perfect regularity, great expedition, and in any desired quantity, has lately been invented, and performs to great satisfaction.†

PULLING.

This should be performed as soon as the leaves begin to fall, and the stalks shew a bright yellow colour, and when the bolls are turned a little brown. The seed will continue to ripen afterwards. When the flax is lodged it should be pulled immediately, *in any stage of its growth*, or it will be entirely lost; great care is requisite in sorting the different lengths and keeping them separate till after the flax is hackled or much waste will ensue in that process.

SAVING SEED.

As soon as the flax is dry enough to put under cover, the bolls should be *rippled*, as it is termed. A comb resembling

* The demand for *Linseed oil* must increase with the population for some time to come, as there appear no indications that the PEOPLE will forsake their *household deities*, CLAPBOARDS and PAINT, 'till the soil is much more denuded of its timber; even in those districts where the roads and fields are encumbered with suitable materials for permanent, *cheaper*, and more elegant buildings.

† Bennett's Machine for sowing broad cast, a description and drawing of which is given in the *Memoirs of the Philadelphia Agricultural Society*, vol. 4. with ample testimony of its usefulness. It is pushed forward by a man like a wheel barrow, and will sow more than one acre in an hour, unimpeded by wind or light rain. They are for sale at Harrison & Earl's Repository for Agricultural Implements in the city of New-York.

the head of a rake but with teeth longer and nearer together, made of hickory or oak, is fastened upon a *block*, and the flax taken in parcels no larger than the hands can firmly grasp, is drawn through, and the bolls ripped off; attention to sorting at the same time should be continued. The bolls are to be riddled and winnowed immediately; spread thin on a clean floor or on sheets in the sun, and when sufficiently dry and beginning to open, threshed. By this method the *foul seeds* are completely separated with little trouble, and good clean seed is ready for an early market, often the best, without the use of expensive machinery to make it so. Here the operations of the farmer ought to end! The PROCESS OF PREPARATION being foreign to, and unconnected with his other pursuits; and which has been the greatest objection to extensive flax culture. Can there be any reason why the farmer is to prepare his *flax* more than the *hides* of his *cattle* which he sends to the tanner? They are both chemical processes; and to dissolve the glutinous or resinous substances by which the fibres are attached to the stem without impairing their strength, is perhaps as *critical* and requires as much care and judgment, as to extract the animal juices from the hides, and fill the pores with *tannin*! In short, the flax *grower* and flax *preparer* and *dresser* should be distinct professions. They are said to be so in Flanders and Holland, and were extensively so in Scotland, where the farmer sold his flax on the ground, or in sheaves at his barn or rick.

The preparation of Flax by steeping is very general in the great flax growing countries in Europe, but it is not quite finished in the water. It remains spread some days on the grass, which is necessary to render it soft and give that *silvery* appearance so desirable. The destructive process of *dew rotting*, is most commonly practised in this country, and when water is resorted to, it is at an improper season, and the process imperfect; which is the cause of its being so *harsh* and *brittle*. Perhaps no part of the system requires

such an allowance for difference of climate. In the humid atmosphere of Ireland, it is not very material when it is spread, but in this climate, when exposed to a July or August sun, every *drop* after a shower, becomes a *burning glass*, and literally scorches the fibres; besides, such a highly putrid fermentation as will then take place in the water, though it separates the harle more speedily, not only injures it, but communicates a *stain* that renders the process of bleaching much more tedious and expensive.

The flax should not be put into the water till about the first of October, and remain from 10 to 14 days, according to the temperature of the weather, and should be taken out before the fibres will separate freely, spread on the grass when the frost will very much assist the operation, and the flax exhibit a *gloss* and *softness*, that it is impossible to give it otherwise. The following method of preparing hemp will apply with great force to the point under discussion. During the late war an experienced ship-master in Connecticut, and who was also a good farmer, raised a crop of HEMP. As soon as it was dry enough to be stowed away, it was put under cover and remained till October; was then put into clear soft water, till the fibres would separate with some difficulty, when it was spread on the grass; the frost completed the operation, and when dry it was immediately secured. There was no putrid fermentation to deteriorate the harle, nor was it mildewed by being exposed to the weather, and when dressed, exhibited that fine *silver green* hue by which the best Russian Hemp is distinguished;* and when *worked up*, was pronounced by the rope-makers to be equal to any hemp ever imported! Here is a lesson for our *western brethren*, that is worth more to them than *real* mines of silver. Clear, soft, stagnant water is preferred in Europe. A canal, forty feet long, six broad, and four deep, is said to be sufficient for the produce of an acre of flax, at one time.

* The best *Riga Hemp*, supplied for the British Navy, is prepared by steeping; during which it is shifted three times.

It should be formed on a clay or some holding soil, where the water from a spring or brook can be conducted in with convenience, the expense would not be great, and on most farms suitable sites may be had. May not boiling or steaming be found the most advantageous process of preparing flax? The very superior sample of thread exhibited at Brighton in 1818, for which Mrs. Crowninshield, of Danvers, received a premium, was spun from flax prepared by *boiling*! It appears by the "transactions of the Swedish Academy," that a method was practised in Sweden, of preparing flax to resemble cotton, by boiling it ten hours in salt water, spreading on the grass, and frequently watering, by which it becomes soft and bleached. Boiling or steaming will not appear very formidable or expensive when we examine the subject. A *box* twenty feet long, six feet wide, and four deep, well constructed with stout plank, a *boiler* from which a large *tube extends into, and communicates with* the water in the box, will boil the produce of a quarter of an acre in a day, that is, if we allow double the room to boil in that is required for steeping. A steam pipe instead of the tube, and having the top of the box well secured, would permit the process of steaming to go on. It is probable that by either method, *grassing* will be necessary to obtain soft flax. The yarns of which the sailcloth is made at Paterson, are all *steamed*. The navy board expressly forbid their being boiled in an alkaline lye, as is usual in most manufactures of linen. It is from this precaution that their canvas has the pliable, oily feeling, which so much recommends it. It should not be lost sight of, that by boiling or steaming much time and expense will be saved in bleaching.

We arrive at the final process, *DRESSING*, and in this our climate gives a decided advantage over Ireland, Flanders, or the north of Europe, where the flax is dried on hurdles, over a peat fire in ovens or kilns, requiring great care in regulating the heat to prevent injury. All this trouble and hazard is obviated by our dry atmosphere and keen north-west winds. Dr. Deane

estimated the expense of dressing flax by hand at one third the product. I believe the present price does not much vary from his estimate. A respectable gentleman from Dutchess county, New-York, informed me, that mills or machines impelled by water, have been erected there, that break and completely dress the flax for a toll of one tenth ! It is said one or more of them are in operation in the western part of this state. These mills were invented in Scotland, and are now said to be brought to great perfection. They are erected in all directions, in the principal flax districts in Ireland, and notwithstanding the low price and limited demand for labour, are resorted to by the poorer classes of people, the dressing by hand being mostly abandoned. There are machines in England that dress the flax immediately from the field, *without any preparation whatever*. An account of them may be found in the 5th vol. of the Massachusetts Agricultural Journal. It appears, by the report of a committee of the House of Commons that in 1817, they were in successful operation. A man and three children impelled the machines and dressed sixty pounds a day. We have no information of any further improvements. Should they be susceptible of the application of water or steam power, in any degree proportionate, the advantages may be incalculable, but, in the present enquiry, we place these machines, however desirable, entirely out of the question.

PRODUCT.

It is not uncommon in Great-Britain and Ireland to obtain eight hundred pounds of flax from an acre ! Six hundred pounds is estimated, in some districts, as an average ; but it should be observed, that little, if any, seed is obtained. The average crop in New-England, as far as our information extends, cannot be estimated at more than two hundred pounds, and six or eight bushels of seed. (We do not include the rich bottoms on the Connecticut and some other rivers.) Dr. Deane was of opinion that four hundred pounds might be calculated on with proper management.

We think that four hundred pounds of good clean flax, and eight or ten bushels of seed, may fairly be assumed as a medium crop on favourable soils, where the culture becomes such an object as to make other farming operations subservient to it, and due attention is paid to change of seed.

Those who grow flax to any extent are of opinion, that the seed, at the price it has been for some years past, pays for all the labour bestowed on the crop to the time the flax is ready to be prepared or rotted.

If we are correctly informed, flax of a fair quality cannot be imported from *Ireland* for less than *fourteen cents* per pound. And the price of the best of *Russia* flax delivered on ship board at St. Petersburg, is ten and an half cents per pound. The quality called "twelve-headed" costs nine and an half cents on board.

The quality of flax raised in this country varies more than any other product; and of course the price, which is from six to eighteen cents. The medium about ten cents per pound.

It must be acknowledged, that no great exertions can be expected in the pursuits of any people, till "the prospect of reward *sweetens their labour.*" And I anticipate the question that some may be disposed to ask, before they have finished the perusal of these essays, "Where is the farmer to find a *market*, if flax is extensively cultivated?" We will ask where could the *planter* have found a market for his cotton if machines had not been invented for spinning it? And how could he have supplied it, if the labour of two thousand hands had been required to clean it of the seeds, that is now performed by the *Cotton Gin* invented by Whitney? We have shown that the expence of dressing flax has been reduced from one third to one tenth of its value;* and it is a fact well established, that there are now in the country, machines for spinning *flax*, that perform as well, and more ex-

*The usual toll for ginning *Cotton* in *Alabama*, we are informed, is one-twelfth.

peditionously, except for the finer threads, than those for spinning cotton! The Paterson *sail cloth* is fabricated entirely from *yarns* spun and twisted by machinery, assisted by as little manual labour as Cotton machines. In those manufactories are *six hundred* spindles. In the state of New-York and in Pennsylvania about *three hundred* more are employed for *sewing thread, sheetings, bed-ticks, shoe thread, twine, &c.* The expence of labour, after the flax is hackled, in attending a machine of twenty-four spindles for spinning common shoe thread, is *thirty-three cents* per day, spinning on an average twenty-four pounds a day, or one pound a day for each spindle! equal, it is said, to the production of a cotton spindle for five or six days!

Can any thing be wanting but the application of POWER LOOMS for weaving linen, to place the manufacture nearly upon an equality with cotton? And is there any doubt but they can be so applied?

The perfection of cotton spinning machinery, and the invention of power looms, with such improvements as are exhibited at Waltham, it is well known are about to produce an entire revolution in the India trade! If they can stop the *spindle* and the *shuttle* of the HINDOO, who is supported upon a handful of rice a day in a climate where little is required for cloathing or shelter, what must be the effect of machines of similar operation in the *linen manufacture*, upon the RUSSIAN and the GERMAN? There is probably at this moment, a million tons of American shipping cloathed with Russian canvas! What, but the raw material of *good quality*, is required to elicit CAPITAL, to manufacture in our country sufficient for this supply immediately, and in a few years even to compete with European nations in the linen market?

The exportation of linen from Germany to North and South America has been, and is at present, of vast amount! The single province of Silesia has sent in one year to Hamburgh and other ports, linens to the value of nearly five

millions of dollars to be shipped, by the circuitous route of Cadiz, to the Spanish colonies. These customers are at our doors. The United States possess the "GOLDEN GATES of this Commerce," and with exertions well directed to her agriculture, Europe will be obliged to surrender the keys.

Brighton, 27th March, 1821.

BENNETT'S MACHINE FOR SOWING BROAD CAST.

Roxbury, 5th May, 1821.

DEAR SIR,

HAVING for some time past thought of cultivating a patch of flax, I was more fully determined so to do in consequence of the essays on that subject, read by you before the board of trustees, at their last meeting.

My friend E. H. Derby, Esq. of Salem, having recently purchased one of Bennett's Machines for sowing broad cast, has been so good as to lend it to me, and with which I sowed my flaxseed, one and an half bushels on one acre and a few rods of ground, on the 25th of April, after having harrowed in clover, herd's grass or timothy, and red top seeds, sown also with the same machine; the ground was again harrowed lightly and rolled, and the flax on the 2d May (only eight days after sowing) made its appearance, coming up very handsomely, and I think much more regularly than it could possibly have been sown by hand; it is not at all in rows, as might be presumed from the appearance of the machine, but, by the shape of the brushes which throw out the seed, it is completely broad cast.

I have also, on other lands, sown ten acres of clover, herds grass and red top seed, and clover and orchard grass, which are making their appearance and look finely. The quantity of seed may easily be regulated from *one pound to two bushels per acre*, and can be extended. My man, with great ease, sowed an acre in less than an hour. On the

whole, I think this one of the most valuable implements ever introduced into this state for agricultural purposes.

The Flaxseed which the society have sent for to different parts of Europe I hope will arrive in season for the next year, and I trust will be a great acquisition.

Believe me to be, dear sir,

respectfully, and with esteem, your's,

JOHN PRINCE.

S. W. POMEROY, Esq.

First Vice-President of the Massachusetts Society for promoting Agriculture.

ON PRESERVING POTATOES FOR SEA STORES OR FOREIGN CONSUMPTION. By MR. CHARLES WHITLOW, of Canada.

[From the Transactions of the Society of Arts. Vol. 33]

SIR,

THE usual mode at present practised for endeavouring to preserve potatoes, is to leave them, after digging, exposed to the sun and air until they are dry. This exposure generally causes them to have a bitter taste, and it may be remarked, that potatoes are never so sweet to the palate as when cooked immediately after digging. I find that when potatoes are left in large heaps or pits in the ground, that a fermentation takes place which destroys the sweet flavour of the potatoes, in order to prevent that fermentation, and to preserve them from losing the original fine and pleasant flavour, my plan is (and which experience proves to me to have the desired effect) to have them packed in casks as they are digging from the ground, and to have the casks, when the potatoes are piled in them, filled up with sand or earth, taking care that it is done as speedily as possible, and that all vacant spaces in the cask are filled up by the earth or sand; the cask thus packed holds as many potatoes as it would was no earth or sand used in the packing; and as the

vacant spaces of the cask of potatoes so packed are filled, the air is totally excluded and cannot act on the potatoes, and consequently no fermentation can take place.

I sailed from New-York to St. Bartholomews, and brought with me two hundred barrels of potatoes, packed in the above manner.

On my arrival at the island I found, as I expected, that the potatoes had preserved all their original sweetness of flavor; in fact, as good as when first dug, having undergone no fermentation, nor in the slightest degree affected by the bilge or close air of the ship. Some barrels of the potatoes I sold there, and at the neighbouring islands, for four dollars per bushel; and at the same time potatoes taken out in bulk without packing, and others that were brought there packed in casks which had not been filled up with earth, sold only for one dollar per bushel, they being injured in the passage by the bilged air and fermentation, being bitter and bad, whilst mine were as perfectly sweet and dry as when dug: what remained I shipped from St. Bartholomews to Jamaica, where they arrived in equal good condition, and sold at a higher price than they had brought at the former island; some of these casks of potatoes were put in a coal cellar by the purchaser at Jamaica, and on examining them when I was leaving the island two months after, I found that they had in a very small degree sprouted, but that all their original flavour was preserved.

CHARLES WHITLOW.

London, New-York Coffee-House, Feb. 12, 1816.

To C. TAYLOR, M. D. Sec.

[The communication of H. B. Way, Esq. printed at page 45, of the present volume, on the preservation of carrots during the winter months, is a confirmation of the plan proposed by Mr Whitlow, for preserving vegetable roots a long time fit for food.]

REMARKS ON SOILING.

[Communicated by Hon. JOSIAH QUINCY, and continued from page 125.]

CONFORMABLY to my promise, I proceed to state the manner in which the soiling process ought to be conducted, by any one, who may originally attempt it; how far it is applicable to the farming condition of New-England; and what species of farmers will find their account in attempting it.

As to the manner in which the soiling process ought to be conducted, besides that general care and personal superintendence, (at least occasionally and by way of oversight) which is essential to success in this, as in every other business in life, three general objects ought to claim the attention of every farmer, or other person, who undertakes this process.

1. Provision against seasons of extraordinary drowth, or deficiency of general crop, from any other natural accident.

2. Succession of succulent food, during the whole soiling season; and facility of its attainment.

3. Preparation relative to care of the stock, and increase of manure; the particular objects of the soiling process.

As to provision against seasons of extraordinary drowth, or deficiency of general crop from any other natural accident, I make this suggestion from respect to an obvious dictate of prudence, rather than because such has been my own practice. In fact, I have never made any such provision. Years of uncommon drowth, or sterility from other causes, are so uncommon in our country, that I have, hitherto, neglected, and without injury, this plain suggestion of prudence. As a general rule, however, a farmer, commencing and adopting this plan, would act wisely, to keep on hand, a month, or six weeks stock of hay or other food; so as to have assurance that his cattle should not suffer from any untoward accident of season. A mixture of dry food, with the succulent, is often very conducive to the health of the animals soiled, and enables the feeder to check the too great loos-

ness of the bowels ; often the effect of high feeding upon succulent vegetables.

Some provision of dry food, against such exigency, and for such purposes, is wise, as a dictate of foresight. It is also as a dictate of economy, as some mixture of dry food with succulent, makes the latter go much farther ; and, on very stormy days, enables the feeder to preserve the general and desired state of the cattle, soiled, with less personal exposure.

As to the second general object of attention, succession of succulent food, during the whole of the soiling season : and facility of its attainment. This includes

1. Nature of the crop used for soiling.
2. Time and mode of sowing and cultivation.
3. Mode of taking and applying the crop, and the relative location of the ground, used for soiling, to the place where the cattle is soiled.

1. As to the nature of the crop used for soiling. This must, of course, be different, in different climates. The English speak of lucerne, clover, peas, cabbages, as used for this purpose. Of all these, clover is that, which is the most capable, in this country, of being made useful in this system. Unquestionably, however, any succulent vegetable, which cattle consume, may be used, according to the discretion, which acquaintance with its nature dictates. Without dilating generally on the applicability of all of these vegetables, and leaving every farmer to take advantage of these and every other, he may deem useful, and find convenient, I shall state my own practice and experience.

These have led me to simplify and reduce the number of vegetables used, for the purpose of making the cultivation and effect of each species selected, a distinct subject of consideration ; and for the enabling me to have the great supports of the system well established. This effected, it is easy to change, and to deviate, into other vegetables, or to introduce them in aid of those, on which any one chooses

principally, to rely. In making my selection, I was guided by the nature of the climate, and by the consideration of the vegetables selected being the best known, and most successfully cultivated in the neighbourhood. I use but four,—1st, grass; 2d, oats; 3d, Indian corn; 4th, cabbages.

1. Grass. I depend upon this for the first month of the soiling season; beginning, in our climate, about the 20th of May, or 1st of June, and terminating about the 1st of July.

In my own practice, I have contented myself with commencing soiling at the time, at which cattle are in this climate usually turned out to grass. It would be wise, and, I apprehend, easily practicable, to introduce some vegetable, which, sown the preceding year, would enable the farmer to commence cutting earlier, and so carry back the commencement of the soiling season to the 1st of May, possibly earlier. This, however, I have never attempted, partly because it required personal attentions, which, I could not give, consistent with my other avocations; and partly because, in the commencement of the system, I thought it wise to limit my experiments to the period, in which cattle are usually kept upon pasture; leaving it to future experience to enlarge the benefits and length of the soiling season. Fearing lest by attempting too much, I might be discouraged, and by failure, in part, might put to hazard the great objects of the system, which are attained, when vegetables taken for soiling are made a complete substitute, for vegetables fed by the cattle themselves from the pasture. For the first month, therefore, of the soiling season, I depend upon grass.

Concerning the quantity of land, in grass, necessary to be applied to the support of any specific number of cattle I have no experience sufficient to state it with accuracy. My own practise has been to cut from the earliest grass I could find, in small pieces and patches about my house, and by sides of an inclosed road, of which I could not easily take an exact measurement. Minute calculations on this point must

obviously be very uncertain and unsatisfactory, as the capacity of every given piece of land, to support any specified number of cattle must depend upon its heart and state of cultivation. It will be sufficient to say that my own experience authorizes me to state, that one acre of good clover, or any early grass, cut for soiling, is ample for the support of six head of full grown cattle, from the 20th of May to the 20th June. As it is best, however, in all calculations of this kind to provide against all contingencies, my rule is to consider *one quarter of an acre* of my best grass producing land as appropriated to each head of soiling cattle, for its support between the 20th May and 1st of July. Less than that quantity has always been sufficient on my farm. If it be not used for soiling, the produce is housed as hay, for the winter.

Small farmers, who should top dress the land every day cut over, with the water leached from the manure heap, would reduce the extent of land required for the process of soiling very considerably.

It is needless to give any directions relating to any particular preparation for the soiling process, for this first period. What is required is only land in its best grass state,—good mowing land,—to be reserved at the rate of a quarter of an acre, for each head of cattle soiled, and for the facility of feeding and of manuring for after feed as near the barn, where the cattle are kept, as possible.

The preparation of oats, Indian corn, and cabbages, require somewhat more particular attention.

Preparation of soiling food in April, for July. 1st. of Oats. These are, on my farm, made to succeed grass, and usually afford a good cut about the first of July. As it is important in every plan of husbandry, to simplify as much as possible, I shall consider oats, as the food exclusively destined for the month of July, although, in fact, at the latter part of the month, Indian corn stalks may begin to be cut; and had often better be commenced, not only for the sake

of diversifying the feed of the stock, but because, the corn stalks cut in the latter part of this month will be more likely to vegetate anew with luxuriance, than if cut later.

With this explanation, I state oats, cut in the milk, to be the food, in this climate, for the support of the soiling process, in July. As it is important to get the cattle off of the grass land as soon as possible, to the end that the winter crop of hay may be the more abundant, so the preparation for oats ought to be as early as possible. It will be best, if the land have been thoroughly ploughed the autumn preceding. It ought to be land in excellent heart, all my calculations being made on land in such a state. It being obvious that calculations on any other must be altogether uncertain and various in result. It ought also to be land, which had been cultivated and well manured the year preceding. As soon as the frost is out of the ground it should be ploughed at least once, and the oats sowed broad cast, at the rate of four bushels to the acre, at least. The land should then be harrowed and rolled. Oats thus sowed, at the earliest moment possible, will generally be ready for the scythe by the first of July.

As to the quantity of land thus to be prepared, one acre, for every four head of cattle soiled; that is, one quarter of an acre for each head, will be sufficient. At least such has been invariably my experience, where the land is in proper heart and tilth. In order to test this point, I have not only observed and compared the general extent of land cut over, with the whole number of cattle soiled, but also have more than once had the quantity eaten by a certain number of head, in a certain number of days, on a measured extent, compared. The result of my experiment is, that *one square rod of oats, in full milk, growing on land in proper (that is, high) tilth will support one head of cattle a day.* One quarter of an acre, or forty square rods, for thirty days, is a fair basis of calculation, and making a sufficiently liberal allowance for accident.

In the outset of attempting this system, I should recommend somewhat enlarging this quantity, that is, sowing somewhat more than a quarter of an acre, for every head of cattle soiled.

1st. Because in farming as little should be left to chance as possible.

2d. Because nothing is lost; if there be an excess, it may be cut and dried for winter food.

3d. Because the necessity for beginning to cut a little before the oats are in full milk, and sometimes of extending the cut a little after that period, will affect the general result of all calculations relative to the productive power of the land.

In reference to the fact, and upon the supposition on which we are now proceeding, that oats alone, without aid from any other product, are relied upon for the whole month of July, the sowing ought to be successive, viz. one half the destined quantity of land, as early as the seed can be got into the land; the other half, a fortnight later, so that the crop may have some succession. It would be probably better if the whole extent destined were divided into fourths, and sowed each fourth with a week or ten days intervening. Thus supposing the number of cattle soiled to be four; requiring one acre, according to my practice; and one quarter should be sowed on the 1st of April, one quarter on the 8th, one on the 15th and 22d. My own practice has not been thus subdivided. I have found one sowing about the 10th, and one about the 15th to answer.

2d. Indian Corn. This, according to that simple plan, of conducting the soiling process, I am describing, is to be relied upon for food during the month of August.

The estimate made concerning the capacity of land in oats, to support stock, may for all practical purposes be assumed to be the same, when in Indian corn; that is, a quarter of an acre to support one head for the month. Somewhat more than that quantity to be sown per head, for the

same reasons as those stated in relation to oats ; the land to be in the same heart and tilth ; to receive, at least, one ploughing, and harrowing, about the latter end of April and in the beginning of May ; after which light furrows should be run three feet asunder, at the depth of three or four inches. In these furrows corn should be sown broad cast, about the thickness, and in the same manner, as peas are sown, in field culture of them. The corn may then be covered by the plough. Although, in my experience, a harrow drawn lengthways, and then crossways, followed by a roller, is sufficient, and to be preferred for this operation.

If the farmer choose, and his fund of manure permit, the furrows, previous to planting, may be lightly strewed with manure, to obvious advantage. This, however, has not been my practice. Grain of any kind, not permitted to seed but little, exhausts the land ; but if it be repeated it will require, of course, some provision of manure to prevent its deterioration. He, however, who carries on a soiling system, upon any important scale, will never want for manure.

Corn thus sown will be ready to cut the latter end of July and the beginning of August. The whole month of August, I have found Indian corn, cut in the stalk, the best soiling food. If, however, the farmer prefer to give a variety he may sow a part of the land in oats, instead of corn, and alternate through the month of August on oats and Indian corn.

In the middle of May, in the beginning and middle of June, and even as late as the first of August, in our climate, a portion of land proportionate to the number of cattle should be sowed in like manner ; on which soiling may be continued during the whole month of September. In this month, however, reliance may be placed upon the grass of the second crop, from those acres from which soiling was effected in the month of June. The grass of the second crop will generally enable the farmer to soil to the 15th of October, if his grass land be in proper tilth and heart.

After the 15th of October to the beginning, or the middle of November, the tops of his winter vegetables, such as carrots, or turnips, and which, in every good system of farming, should be raised in proportion to the stock kept, should be relied upon.

After which cabbages should succeed until the time when all cattle are housed in this climate.

Reduced to a single statement, my experience and system, is, for the support of my soiled stock during the months of July, August and September, to sow, in the months of April, May, June and July, equal to three quarters of an acre of land for each head of cattle soiled, in such succession as will give also a regular succession of succulent food, in the three first mentioned months.

For their support from the 20th May and during the month of June, I reserve early clover or other grass, at the rate of one quarter of an acre for each head of cattle soiled.

For their support during the first half of October I depend upon the second growth of the half acre, cut over in May and June, and the second growth of the oats and corn cut over in July.

This period, between the 20th May and the 15th October is the only one on which I rely on grass, oats, and Indian corn; and includes a reservation and employment of land, equal to one acre per head of cattle soiled.

My own experience has been always less than this. Never having exceeded, as I believe, seventeen acres for twenty head; and those, never in that state of high tilth, which in this systematic statement I recommend.

In truth, the capacity of an acre to maintain cattle, in a soiling process, if conducted with due attention to develop its full powers, is probably four, or five times greater than this, but I choose to raise no extravagant expectations. In the commencement of every new system, mistakes will be made. Great diversities in quality or state of land must

exist, and will, of course, occasion a diversity in result. Besides, the soiling process, beyond all others, requires vigilance, and foresight. Cattle, in this process, are not left to range over an immeasurable extent of pasture, composed of grass, heath rock, marsh, brush and briar, about which the owner makes no calculation; sometimes stocking it beyond, and sometimes beneath its power; in good seasons keeping them well, in bad affording lean and scanty fare, scarcely sufficient to support life, and wholly inadequate to a profitable return. In the soiling process they are put under the care of intelligence. It must exist and must be exercised. If this be the case, the reward from the system, on farms suited for it, is ample. For myself, after a trial of six years, no consideration would induce me to change it for the old method of pasturing.

It remains to explain the soiling system during the residue of the season, viz. from the 15th of October to the middle or the latter end of November; at which time stock, in this climate, usually begin upon their winter food. In my system, I have depended upon the tops of carrots and turnips, destined either for the market, or for the winter food of stock. My practise has been to raise from eight to twelve acres of vegetables. The tops of which, with a single foddering of salt hay, per day, have been, according to my experience, sufficient to support, equal to twenty head of cattle from the 15th of October to the middle or latter end of November.

If, however, the farmer is not in the practice of raising a sufficient quantity of roots, to yield a support for his stock, for six weeks, cabbages are, in this climate, the farmer's best dependance; after the second cutting of the grass, and corn, and oat fodder, fail.

The preparation for cabbages, in field culture, is so well and universally known it needs no explanation. It is sufficient to say that, in suitable soil, well manured, a thousand

plants, weighing, upon an average, fifteen pounds, may easily be raised on the eighth of an acre. These, at 200 lb. per day, per head, or $13\frac{1}{4}$ cabbages, will be sufficient for each head of cattle seventy days, which is ample for the support of each head, to the first of December.

With respect to care of the stock, and increase of manure ; the particular objects of the soiling process. All the care of the stock, requisite, is keeping them clean, and currying them, every day ; throwing the manure into the proper receptacle ; seeing that the cattle are regularly and sufficiently watered ; and that they be permitted to be at large in a yard, of a common barn yard size, at least two hours, in the morning, and two in the afternoon. The yard will be best if a part of it be shaded, or sheltered from the direct rays of the sun.

The food is distributed in racks, under cover, or in the barn, about six times a day, in due proportions, which the usual practical knowledge of a farmer will easily regulate.

A cellar under the barn, or at least a covered receptacle for the manure, clayed at the bottom, or stoned, so as to be water-tight, to the end that the drainings of the manure should not escape in the subsoil. The yard and floor of the barn should, also, be so constructed, as to direct the urine into such a covered, water-tight receptacle.

This is particularly necessary in the soiling process, inasmuch as the manure made by succulent food is rich, and watery, and liable to be in a degree wasted by the action of the sun's rays, in an open yard. But when under cover, it is the richest of all manures of like species, and is qualified beyond all others, to impart its riches to soil, and earth thrown into the receptacle, and mixed with this summer's manure.

Hogs, also, should be permitted to range into it from the hogpen, not only for the purpose of mixing the deposit together, but also on account of economy ; in all soiling, some

waste of green food is unavoidable, either from sometimes cutting more than can be consumed in the day, or from its being blown upon by the cattle. This hogs consume and prevent loss of it.

The increase of manure in this mode exceeds all anticipation. It is on this account that the soiling process claims the attention of farmers, who are always ready to say, "We can do well enough, only give us manure. The want of manure is our great want." This is supplied by the soiling process, in a mode cheap, easy, within the resources of every farmer, and leading, in its event, to the highest and most satisfactory of all methods of conducting a farm.

I have been the more minute, in this statement, and shall not fail, hereafter, to communicate my experience, in this system, because I apprehend it is peculiarly suited to the farming condition of Massachusetts; and although it is, at present, almost unknown, and wholly unpractised; at least, I have never heard that it is as yet practised, upon any considerable scale, on any farm (except my own) yet I am satisfied that it will gradually grow into use; and the sooner, it can be made to be understood, and the way shown, the better for our commonwealth. A farmer, now-a-days, who has but thirty or forty acres of land, feels himself, in some measure, straitened for want of room. He is tempted to buy pasture ground; to widen his surface; perhaps to run in debt; and embarrass himself for life, for the sake, of what he thinks, the "*one thing needful*" for a farmer—*much land*. When his sons come of age, if he cannot give them more than thirty or forty acres, they must abandon their homes, the land of their fathers, and all the privileges of a cultivated and improved society to seek a *great farm* in western wildernesses.

Now all this is mistake and want of knowledge of the productive power of the soil, when highly cultivated. The first step for farmers to take is to reverse their old prejudices in this respect, and instead of calculating how much more

land they want, let them try with how little they can do ; and do well.

There is no proposition in nature more true, than that any farmer may maintain upon *thirty acres, of good arable land, twenty head of cattle*, in better condition, with more profit, with more comfort to the animals, with less labour, less trouble, and less cash advance, to himself, than he at present usually expends upon a hundred acres. In addition to which he will have the great satisfaction of seeing, in time, every square inch of his land productive, instead of seeing, as he does now, not more than one part in four of his farm producing any thing ; or at least any thing that will pay the expence of harvesting.

But how is this practice to be introduced ? I answer. Gradually. Let farmers "feel their way" into it. If any farmer thinks that he wants more pasture land, in order to keep more cattle in the summer, in order to consume his hay, or to make manure, in winter, instead of running in debt, or laying out his money in more land, let him keep himself free of debt, or put his money out at interest ; and try soiling. Let him be assured he will find his account in it. But how shall he try ? Shall he shut up all his cattle at once ; enter upon a scheme recommended by book writers ; and perhaps fail, either from accident, or misapprehension, the first year. By no means. Every practical farmer, if he be wise, will, on the one hand, never utterly slight the suggestions of books and writers on the subject of his art ; and, on the other, will never enter upon them, at once, on any great and decisive scale. As the saying is, "he will always feel his way." Thus, for instance, in this case of soiling. A farmer, ignorant of the subject, yet willing to try the experiment, should commence with one or two head of cattle. Let him set aside, at first, two acres of land for each head. Nothing will be lost if there be an excess of the oats, or corn, sown for soiling, beyond the consumption, the surplus

cut in season, will remain for winter's food. Let him go through, for one year, a course of soiling such as is suggested, for one or two head of cattle. Let him oversee the feeding himself; or by a confidential hand. A boy, if trustworthy, is sufficient for such an experiment, acting under the daily directions of his father, or master. Let him provide a pit, or cellar, covered, or under the barn, or so placed in relation to the cattle soiled, as that the manure and urine can be easily preserved; the cellar, or receptacle, being water tight; if this be so situated as that his hogs can have fair play among the deposits, it is impossible but that he will find his account in it.

One year's success will enable him, and, I cannot question, will induce him, to double, if not treble, his next year's experiment. Soon he will, if the nature of his farm permit, shut up his whole stock; and ultimately will arrive at a state of conviction and feeling, such, as will never permit him again, on any consideration, to allow cattle to run at large, on any of his land, which is capable of being ploughed and mown.

I know it will be asked what shall be done with rocky land, and land suitable only for pastures? My answer is, that where a man *has nothing else*, but rock or pasture land, or sand, which cannot be made subject to cultivation, a man must manage according to his condition. Good farming is making the most of land, according to its species. If a man has a sand bank, on the margin of the ocean, he will best make salt. If he have nothing but some perpendicular mountain rocks, he will best, probably, keep goats. So of the rest. Farming, to be good, must always have reference to the species and capacity of the soil.

The system I advocate has reference to *arable land; to that portion of it on every man's farm, which is capable of being ploughed, and mowed over.* Every man who wishes to make the most of this part of his farm, will effect this the

most certainly, the most economically, and the most satisfactorily by the mode I recommend. If a man have part pasture and part arable, he may soil for part, and pasture for part. There is nothing inconsistent in this; on the contrary, the soiling is a great support to the pasture; because when the pasture fails, as in dry seasons it often will, a man, who soils part, will always provide a surplus of his soiling food, to meet such a contingency.

In answer to the question, what species of farmers will find their account in attempting to soil? I answer. EVERY FARMER, WHO WANTS MANURE; AT A CHEAP AND EASY RATE. The greatest profit of soiling arises from the quantity of manure it enables the farmer to make; more than doubling it upon the same stock. It may be adopted, I apprehend, as an axiom, almost universal; certainly so, except in cases of very great proximity to a town or village, that soiling is the cheapest of all modes of obtaining manures. In this point of view, the saving of fence, the economy of land, of food; the increase of milk, and the better condition of the cattle; all of which have been shown to be the consequence of this method, may be considered as incidental to the system, as an offset for the labour requisite; giving the manure made as a clear gain; and what is more, without the loss and trouble, and expense, of carting from a distance. It is not only made, but it is placed, just where it should be, in the farmer's own stercorary—or, covered manure heap.

The rich farmer, and the extensive land holder, ought to avail himself of it; *if he wants manure*. Such farmer, if he have capital, may stock his pasture land up to its full pasture power, and keep a number of head additional on the soiling system, according to the quantity of manure, of which he stands in need. But the conduct of a farm, upon a great scale of this nature, depends upon so many circumstances, that the particular mode or extent of applying this system, as

subsidiary to pasturing, cannot be prescribed by any general rule. Calculations must have reference to a knowledge of all the particular circumstances and relations of such a farm, and such a capitalist farmer.

It is to small farmers, those who possess twenty, thirty, or forty acres of land, to whom this system is peculiarly applicable. Upon this they may build up a most prosperous agriculture, with little capital, little more than ordinary trouble, and little or no risk; relieved from debt, which is so frequently the farmer's ruin, under the idea of the necessity of purchasing more land, and relieved, also, from the pain and vexation of owning and superintending a vast surface; every where less productive than it ought to be, and in a very great proportion, often not productive at all.

I have, thus, endeavoured to give, according to the request of the Trustees, an account of the mode of my conducting the soiling process, and the result of my own experience. It is now six years since I commenced it, and no consideration would induce me to abandon it. Every year brings new conviction of its facility and its productiveness.

If small farmers, would be persuaded to commence the system upon a small scale, with one or two head of cattle, they would gradually become acquainted with it. Success would inspire confidence. Until enlarging the number of cattle soiled, they might, in time, easily keep one head per year for every acre of land they possess. Far greater than this, would be the fair, ultimate, result of the system, if wisely conducted. Besides which, they would find other economies and advantages resulting from it, amply compensating for all the increased labour consequent upon the process.

ON THE USE OF GREEN VITRIOL AND DILUTED SULPHURIC ACID, AS A MANURE.

[Communicated for the Agricultural Repository.]

To the Corresponding Secretary.

SIR,

SEEING in the last number of your Repository an article on salt as a manure, I beg leave to offer, for the consideration of farmers, the evidence I have been able to collect in favour of two other substances as manures, not, I believe, generally known among us as such, but thought to be deleterious. Massachusetts, in common with some others of the United States, abounds in the ore of copperas or green vitriol. In some parts of the commonwealth, I have observed many of the stones in the walls on the road side covered with an efflorescence of this salt, and the general appearance of the rock indicating a rich one. The colour of the stone is a dingy yellow, with here and there a blueish metallic shade. It may be readily known by the common farmer from its tendency to crumble when exposed to air and moisture, and from the white powder sometimes seen on its surface, and which has a sharp acid taste; wherever the loose stones of this species of rock abound, there probably will be found, at no great distance, ledges of the same. This salt is composed of oxyd of iron and sulphuric acid. The latter ingredient is supposed by some, to be the fertilizing principle of gypsum or Plaster of paris, and this opinion is strengthened by the fact that diluted sulphuric acid is known to have the effect of a manure. Others, again, contend that the chemical affinity of the acid for lime is so strong, that it cannot be decomposed by any thing it may meet with in the soil; but that it operates in its concrete form as a stimulus to vegetation. This is, after all, but matter of conjecture, and neither on the one side nor the other

will the knowledge at present possessed authorize any thing more conclusive. In some instances, when plaster applied to the soil has been found inert, a small quantity of stable manure, another season, on the same land, has produced an effect not to be accounted for from the stable manure alone. It has been supposed, that in these cases, the plaster which before lay dormant, was decomposed by something this manure contained, and that the increased activity of vegetation was the joint product of both. Some years ago, I saw on a farm at Borden Town, in New-Jersey, a substance which was there called *Marl*, and which had altogether the appearance of the pulverized copperas ore, which I had seen at Thetford, in Vermont. It was a blackish grey earth, and contained a considerable quantity of *pyrites* in small crystals. I witnessed its effect as a manure on a field of clover, which was remarkably luxuriant, while another adjoining part of the same field, to which it had not been applied, was far less thrifty.

A very large stratum of earth which formed the bank of the river (Delaware) for some distance was of this substance. That there was a considerable portion of the sulphate of iron or copperas in this earth, there can be no doubt; and that this constituted its fertilizing principle, may perhaps be fairly inferred from the following considerations.

Dr. Pearson, as stated in his communication to the Board of Agriculture in England [vol. 4. page 319], ascertained by analysis, that the salt of peat, which is sometimes observed on the surface of this substance, chrystalized and very white, was pure *sulphate of iron* or copperas.

This salt had been discovered some years before the analysis by Dr. Pearson, to be a powerful manure, and grew rapidly in reputation after it came into use.

Dr. Barton, of Philadelphia, in a letter to Dr. Pearson, says, "I have for some years been engaged in an extensive series of experiments, relative to the effects of various stimulating articles, such as camphire, &c. upon vegetables,

and on the absorption of certain powerful mineral substances into the organic system of vegetables. In numerous instances I have subjected the stems and leaves of plants, young and old, large and small, to the influence of the sulphates of iron and copper. I have found that both of these metallic salts are very greedily absorbed by vegetables, inso-much that I have detected the presence of iron in the vessels of a branch of mulberry, at the height of five or six feet above the place of immersion in a solution of the sulphate of this metal. Sulphate of iron applied to vegetables is a poison, like almost every thing else, only from the overdose. In several of my experiments, the branches of vegetables that were placed in vessels containing solutions of the sulphate of iron and copper, lived longer, and exhibited more signs of vigour, than similar branches that were placed in equal quantities of simple water. I have also found that large doses of nitre produce an appearance like genuine gangrene, in the leaves of vegetables, and yet it is certain that nitre, when it is judiciously dosed, may be made to assist greatly the healthy vegetation of plants."

It is well known that peat ashes are much used in England, and elsewhere, as a manure. Professor Robison, quoted by Dr. Pearson, says, "that peat ashes always contain a great proportion of iron, that he had seen three places in Russia, where there was a superficial peat-moss, and in all of them, the vitriol was so abundant as to effloresce." All peat, however, does not contain the salt in equal quantity, and sometimes probably it contains none.

A preparation of pyrites, or *sulphuret* of iron, is used in Flanders as a manure. Chancellor Livingston gives the following account, (published in the New-York Society's Transactions, vol. 2.) "In an excursion that I lately made into Flanders, I observed at some distance from the road, several large beds of earth, that appeared to me to emit smoke and flame, which two men were tending. I found that it was pyrites, sufficiently impregnated with sulphur to

burn when dry. This was laid into beds and fire set to it. They endeavoured to extinguish the fire when the ashes were red; if it burned longer, it became black, and the quality of it was not so good. This earth, so burned, was easily reduced to powder by a wooden mallet, and in this state was carried on the backs of asses, forty or fifty miles, as manure, and was used particularly for grass, at the rate of about six bushels to the acre. The seed grain was covered with it as with gypsum in our country. This circumstance induces a belief that the sulphuric acid is both in this and in the gypsum the fertilizing principle. It is presumable, says he, that in this very slow combustion, the sulphuric acid is absorbed by the ashes, or rather earth, while the inflammable matter is dissipated, and that the union of the alkali and the acid forms a salt not unlike, in its chemical relation, to gypsum, or perhaps one that is more soluble, more impregnated with the acid."

Perhaps it would be a more correct explanation of what takes place in the combustion of the pyrites, as above related, to say, that the sulphur of the pyrites by an union with the oxygen of the air, and of the moisture, disengaged from the heaps, forms sulphuric acid and again combines with the iron of the pyrites, forming the sulphate, which afterwards mingling with the earthy particles of the heap, becomes the efficient cause of vegetation as it is in the ashes of peat. The ashes of turf, which, the chancellor says, is supposed in Holland to contain sulphur, and which, no doubt, contains sulphate of iron, is purchased at a high price, and carried into Brabant and Flanders as a manure.

M. Berard, quoted by Judge Peters, vol. 2d of the Philadelphia Memoirs of Agriculture, supposes that the plaster of paris owes its efficacy to the sulphuric acid. "The fertility of the lands abounding in volcanic matter, as in the neighbourhood of *Catania* in Sicily, and near Naples, &c. where the soil is evidently combined with the ashes of the volcano, or of decomposed lava, afforded a strong proof of the vegetative virtue of sulphur."

“M. Berard caused brimstone to be pounded and sifted, and mixed with *ashes* to render the sowing easy. Having spread this powder on *clover* and *lucerne*, on *wheat* and *natural grass*, he waited the effect. It was surprising on the *lucerne* and *clover*, but *little perceptible on the wheat and natural grass*. Repeated experiments gave the same results. It was particularly remarkable that its effect was the most prompt when after its application, a shower of rain fell.” The water no doubt facilitated the formation of the sulphuric acid; a combination which the sulphur enters into before, probably, it ever becomes a manure. This same writer recommends sulphur as an ingredient in composts for vines, and reminds us of the fine quality of the wines produced from soils of volcanic origin which contain sulphur.

Judge Peters remarks, “that a small infusion of oil of vitriol in a large portion of water, promotes vegetation, and banishes insects from garden plants.” It has been used in the proportion of an oz. of vitriol to a gallon of water, with advantage.

Sir H. Davy in his elements of Agricultural Chemistry, supposes that in all the instances in which either sulphuric acid or sulphate of iron operate as a manure, the acid first combines with lime to form gypsum. The ground of this opinion is that he has detected gypsum in all the plants for which the substance was used as a pabulum. On the other hand, Dr. Barton in the account of an experiment, before mentioned, made with the sulphate of iron as a manure, states that he found iron in one of the branches of the plant, which he had subjected to an analysis. From which he would lead us to infer that the sulphate of iron was not decomposed to form gypsum.

Sir Humphrey Davy gives it as probably *the reason why gypsum is not generally efficacious, that most cultivated soils contain it in sufficient quantities for the use of the grasses*. He must mean also to say, that the reason why in certain instances it is not found efficacious for grain crops, is that the

soil already contains it in sufficient abundance. If his position be true, it is not so much owing to the presence of gypsum in any case, that such wonderful effects are produced on vegetation, as it is to the presence of some other constituents of the soil, which are wanting where it produces no effect; else according to his supposition, vegetation, in this latter case, would be as vigorous as in all others, in which gypsum is applied. Now we may ask what are those other ingredients in the natural soil where gypsum is not found, which act so forcibly when gypsum is added? It does not become an unscientific farmer to discard hastily the opinion of a man so worthy of all respect as Sir Humphrey Davy, but, if he be correct, all those soils which have not naturally enough of gypsum, have some constituents of great power, which are perceived to exist when gypsum is added, and of which it would be extremely desirable to know the nature, and how they could be come at, in order that they might be employed to fertilize such soils, as according to Sir H. Davy, have a complement of gypsum.

If gypsum produces no effect on vegetation, it is because there is already gypsum enough, and neither sulphate of iron, nor sulphuric acid, nor peat ashes can operate as a manure, until the acid they have combines with lime to form gypsum; then the trial of these substances in many parts of Massachusetts would be of no avail. It may, however, turn out on experiment that they are efficacious where gypsum is not.

In a former number of this journal there is an article on the use of burnt clay as a manure. The writer confines himself to a statement of facts as far as I can remember, and attempts no solution of the mode of its operation. The adhesive quality in clay is the great objection to it for vegetation where it exists in great mass. Its adhesiveness is supposed to depend upon its union with an acid. It is said by Mr. Crookshank, (vol. 2, Trans. of the Soc. of Arts,) "That burnt clay dissolved in sulphuric acid, recovers its ductility.

'There is, says he further, certainly an acid emitted from it in burning bricks, as is evident to the smell, after a certain degree of heat has been communicated to the kiln; but of what kind this acid may be, I cannot say, though I have seen carriers learn to their cost, that it would stain their leather black, if by any means it happened to get mixed in sufficient quantities with the astringent juice of the oak bark used in tanning." I have seen the leaves of fruit trees blighted by the fumes from a brick kiln in mid-summer; although at the distance of fifty rods from the kiln; an effect proceeding probably from the acid of the clay; or more probably from the sulphate of iron.—Common clay contains a considerable portion of the oxyd of iron, from which the brick receives its red colour.—In the process of burning, this oxyd unites with the acid, and forms the sulphate, and hence we are to account for the effect of the fumes of the brick kiln on leather noticed by Mr. Crookshank.—The *tannin* decomposes the sulphate, and the iron is precipitated, and leaves the black stain.

In burning clay by slow combustion for manure, in the manner recommended in a former number of this Journal, we may fairly presume, that green vitriol or sulphate of iron, is formed in small quantities, and intermixed with the earthy and pulverized mass—and that the latter, when used as a manure, derives its virtue not so much from the mechanical division of its parts, as from the presence of this salt.

The body of testimony here exhibited in favour both of the *sulphuric acid* and of the *sulphate* or *copperas*, as manures, seems entitled to some consideration. But substances of such great power ought to be used, as is obvious, in a very diluted state, as well as the marine or other salts, which have been erroneously held to be poisonous to vegetation. They are injurious only when used in too great quantity.—Every species of aliment will prove a poison both to animal and vegetable life, if too much is administered—while on the contrary, arsenic, as has been justly said, in connexion with

this same subject, when taken into the human system, in extremely small doses, is sometimes a useful stimulant and powerful corrective.

Gravelly and sandy soils have been thought to be most benefited by the use of sea salt and sulphate of iron and the sulphuric acid ; and clayey land by lime.—About a gallon of water to an ounce of vitriol or of the copperas, has been found on experiment to be the proper degree of dilution. But proceeding on a larger scale, seven bushels of the copperas beat to a powder, may be considered a proper proportion for an acre. Peat ashes, where it has been found to contain a considerable portion of this salt, has been used with advantage, at the rate of fifty loads to the acre,—burnt clay at the rate of from thirty to fifty loads.

In those parts of our state which possess much of the rock which contains sulphur and iron, in so great quantity as that it decomposes easily when exposed to the air or to moisture, the farmers may find it profitable to break up the stone into small pieces, and to throw it on a platform of boards, or place it in some other convenient situation, to catch the wash from the mass after rain, when it shall have been a sufficiently long time exposed to have considerably decomposed—or the heap may be artificially watered, and the lixivium received into a vat.

One cannot but wish that a more precise knowledge were possessed by intelligent husbandmen, of the just value of all substances which invigorate vegetation, and which are within the reach of all for use as manures.—Animal dung and some few other things are used by every one with entire confidence in their efficacy.—But many others, and among them the different kinds of salts in their pure state, are held in a vague sort of distrust as manures, not absolutely denounced as known to be fatal in all cases to vegetation, but thought to be of so equivocal a character as fertilizers, as to make it on the whole inexpedient to meddle with them. It is perhaps difficult to bring the mind to realize that a small quantity of con-

centrated salts or other active agents embodied within a small compass, can have the same effect as great masses of barn yard manure. This is without doubt one cause of the incredulity still entertained by some as to the efficacy of plaster. But chemists might shew us by analysis, that all the vegetative virtue of a buck of dung may be resolved into a few salts, a little earthy residuum and pure water—and the salts be found not to fill a peck measure.—When the farmer sees the fumes rising from a heap of stable manure, and mingling with the air, perhaps it does not occur to him that this light and pungent vapour is the life of his manure. One fact will place this in a strong light. Sir Humphrey Davy, in order to test the power of the fumes of a dung hill, tried the following experiment. He filled a bottle with fresh stable dung, and applied the nose to the roots of a grass sod. In a short time the blades began to spring with new vigour, and the grass soon far surpassed in luxuriance other grass around it, which had not the benefit of this stimulus.

All that is absolutely necessary to make any soil fertile in the highest degree, may exist in so concentrated a form that a few pounds weight, brought to a diluted state, shall be sufficient to give a luxuriant crop to an acre.—Perhaps a chemist would say that all our active manures, which are now carried about in such cumbrous loads, will hereafter be presented to us in the form of a pure extract, and in this shape be brought into general use. We do not mean that stable manure, for example, should be subjected to a chemical operation for this purpose, but that we may derive, to a certain extent, from other sources, the virtues which we find in that, and command and apply to the soil the fertilizing principle with less expense and trouble. Thus we may enjoy an advantage similar to that which is likely to attend a recent discovery in regard to the Hop, viz. that “near the base of the flower there is secreted a semi-resinous substance in the form of minute globules, which is the seat of the whole bitterness, for which the hops are generally prized and consumed—and

in which its fragrance and essential properties reside.* Dr. Ives, of New-York, has pointed out a vast saving, which would take place in the expense of transportation and storage, if an article containing all the strength of the hop, and occupying but small compass, were substituted for one which is of more than twenty times its bulk."

Salts are a durable manure. Their effects have been known to last fifteen years. Stable manure owes its power in part to the extrication of much heat which is disengaged in the fermentation it undergoes in the soil. And when after two or three years this fermentation has ceased, the substance of it existing in the form of salts, is too small in quantity to produce longer any sensible effect;—as much stable manure applied at once to the soil, as would contain a permanent base of salts, equal to a few bushels of marine or vitriolic salts, as a manure, would generate heat enough in the process of fermentation to destroy all vegetable life. On the spot where a heap of stable manure has been suffered to lie leeching a few weeks, if it is a grass field or old pasture, the salts of the manure, after the second year, having in that time become sufficiently diluted, begin to act as a manure, and will continue many years to produce so striking an effect on vegetation as to distinguish this spot from every other in the field.

The *salts of ley*, so called by the soap boilers, is now thrown away, as of no use, and is called *waste*:—were this applied to the land, reduced in strength by water or by intermixture with earth, it certainly would be found in some instances, at least, a powerful manure.—Salts destroy insects. I have seen in a late newspaper, a sensible letter from a Pennsylvania farmer, in which he states that he has used common salt, at the rate of seven bushels to the acre, for the double purpose of destroying insects and enriching his land.—The salt is sown very early in the spring and afterwards ploughed in.—He says it effectually destroys insects. The heat of stable manure is well known to be genial to various

* Bigelow's Botany, vol. 3. part 2.

kinds of vermin : and in *this land of insects*, as it has properly been called by Professor Peck, it is highly important all means should be employed to exterminate those of them which are noxious to esculents.

It is a circumstance in favour of the general use of barn yard manures, that they contain so great a quantity of components, as that no soil fails to derive benefit from some one or more of them. But if it can be ascertained by experiment with the various substances they contain, (as these have been already discovered in part by chemical analysis) which of them are best suited to particular soils and particular crops, the components of dung may be obtained perhaps at a cheaper rate and applied to the land more profitably from some other source. A regular series of experiments by a number of gentlemen on different estates, which should embrace a fair and full trial of all those substances which may be called *uncertain manures*, could not fail to give valuable results ; particularly if the experiments were pursued systematically, and the gentlemen would hold themselves responsible to communicate faithfully their experience. Good things are some times lost sight of amidst the multiplicity of other cares, or because in point of interest, they are not immediately important enough to be regarded by those who are best able to ascertain their true value, and whose recommendation would go far with the public.

I beg leave to trouble you with a few remarks in relation to the management of stable manure. An agricultural chemist who should watch the progress of a heap of this manure, as it is commonly treated, from the time it is first formed in the yard until it is used, would perceive that it had lost from 50 to 75 per cent of its value. Suppose a large heap of carrots exposed in a field all winter to the frost, without any covering, and in mid winter after those on the outside and to a considerable depth, were frozen, the farmer should go to work and turn the heap ; turning those which were frost bitten, in, and a portion of those which had not as yet suffered,

out, to take their chance for the rest of the winter.—The heap being very large, a few bushels would be found probably sound in the spring.—With almost as little consideration do farmers some times manage their manure heaps. Every farmer who would make the most of his manure, should provide before hand, a large mass of earth in his barn yard, and intermix the manure as it is made with a portion of this, both for the purpose of preventing a violent and destructive fermentation, and to take the natural vapour of the dung. And as often as the heap is turned, there should be left over it when the work is done, a crust of earth three or four inches thick, to keep in the fumes and promote their consolidation with the mass. There is nothing new in this method of managing barn yard or stable manure, to the theorist and the really good farmer. But no one can say with any propriety, that it is not new to him, if he has not practised it.

A FARMER.

COL. PICKERING ON THE LOCUST TREE.

Salem, March 2, 1821.

DEAR SIR,

I HAVE just now read, in the last number of the Massachusetts Agricultural Journal,* the remarks and questions of the Trustees prefixed to General H. A. S. Dearborn's letter on the Locust Tree, and the destructive worms which infest it; on which subject communications are requested.

To the first question I answer, that *climate* appears to have no influence on the insect; for in New-Hampshire are locust trees uninjured, as well as in some of the southern states. But in the latter the insect is not unknown. In the city of Washington I have noticed the stems of young trees full of the same bunches which distinguish those in Massachusetts, infested by the worms: while in Georgetown (ad-

* No. 3. vol. vi.

joining the city) I have seen thrifty locust trees, of a larger size, unmarked by a single worm. The latter had not been *transplanted*, and so *debilitated*; and were likewise so near together as to effect a mutual shade.

To the second, that although white washing with lime is unquestionably a useful, (but probably not an effectual) remedy, and applicable to a small number of trees, it may be nearly impracticable to extend it to a forest. A close growth of the trees, so close as to form a continual shade, I have reason to think would operate beneficially, though not to the entire exclusion of the insect. About twelve years ago I sowed a parcel of locust seeds in rows three or four feet apart. They now form a small thick grove. I repeatedly transplanted some of them, at the distance of a rod, on the two sides of a lane. These were attacked by the insect; the worms perforated the stems; and in high winds they were easily broken off. I renewed the planting; but the same evil ensued; while those remaining in the grove are not so much infested as to prevent their growing with tolerable thrift.

My own practice is an answer to the third question: The locust trees of the northern and southern states are of one and the same species: All the seeds I have sown were gathered from locust trees in the district of Columbia—chiefly in Georgetown. There the product of seed is very abundant; and to such a degree, that I think it would be easier to gather a peck in that district, than one quart from any trees I have seen in Massachusetts.

Yet I believe the Locust tree to be indigenous in Massachusetts and New-Hampshire: at least the *latitude* does not forbid the supposition. I have passed through a township in the state of New-York, above the forty-second degree of latitude, in which the *native forest trees were locusts*. The greater part had been felled, and split into posts and trenails—the latter carted across to the Delaware, and floated on rafts of boards to the Philadelphia market. Some large trees remained standing.

I am satisfied, that, above all other trees, the locust should not be raised in nurseries. The seeds sown at the time of planting early beans, soon vegetate; and on a barely middling soil, will rise, the first year, to the height of two, three and four feet. I have had a small number rise to the height of five feet.

You may have observed, that in the annual shoots of young locust trees, there are protuberances of an inch or more in length, in which the twigs are of twice the size they bear on each side of them. In every protuberance is a worm, of a reddish colour, which lives and has its growth on the pith. What insect is produced from it I do not know. I recollect that professor Peck describes two species of insects that infest the locust. Perhaps this may be one, and that described by General Dearborn the other. I have thought that were I to raise a considerable number of locust trees with a view to timber, I would constantly cut off every shoot, in which a protuberance appeared, while the worm was in it, and burn it.

I have thought the most eligible mode of raising locust trees in quantities for timber, would be to take a piece of land in tillage, plough and harrow it, mark it into squares, of three or four feet, and plant the seed at the crossings of the lines, three or four seeds in a spot, and after one year's growth to pull up all but one. Perhaps, too, it may be eligible, in the spring of the next year, to cut every tree down at the ground, to produce a more vigorous growth; as the locust springs luxuriantly from the stump.

I am, dear sir, very respectfully yours,

T. PICKERING.

John Lowell, Esq. Corresponding Secretary.

GENERAL SUMNER ON THE LONG WOOLED SHEEP.

*Boston, April 14, 1821.**Richard Sullivan, Esq.*

DEAR SIR,

I HAVE the pleasure to enclose to you, two ribs of corned mutton, from the fore quarter of a three year old wether, of the long wooled breed of sheep, of Bakewell's cross. The sheep was raised and fatted by Aaron Clement, Esq. near Philadelphia, and was killed in March, 1820. He was fed, during the summer, on picked grass, with 15 or 20 others, and for the 4 or 5 months following, with ruta бага and corn, as much as he could eat. He weighed, in the quarter, one hundred and forty-nine pounds; and the flock was sold at \$20 a head to the butchers, who obtained \$3 a piece for their skins, and as much more for their rough fat. One of them had a caul which weighed 19lb.; and if you take the trouble to measure, you will find the clear fat on the small ribs of this, full three inches thick.

I took charge of the sample which Mr. Clement presented to me, for the purpose of showing it to the trustees of our Agricultural Society, which I wish you to do for me at their next meeting, as I am well convinced, that their patronage is necessary to the introduction among us, of a breed of sheep, which from the length, strength, and quantity of their wool, as well as from their size and disposition to fatten, would be a valuable acquisition to our farmers and manufacturers.

I am interested in an establishment for the manufactory of worsted, and good combing wool is extremely difficult to be found. One reason of this has been, that no other breed of sheep, but the Merinos, has received much of the public attention; and sheep of all kinds have been permitted to run together, so that there is not in the country, perhaps, any but the Merino breed of sheep, which has been kept

pure and unmixed. Another reason is, that although a considerable quantity of long wool is pulled and sheared in this part of the country, yet, all that is sheared on the same farms, is usually packed up together, without regard to the various uses for which it is purchased. The hatter wants wool of one quality, the spinner of another, and the comber of another. Hence it is apparent, that if our wool, when it is brought to market, should be properly stapled, so that the manufacturers should not be obliged to buy what they don't want, in order to get that which they do, they could each afford to pay a higher price for what they purchase, and the farmers would, of course, turn their attention to the cultivation of that kind of wool, which is most in demand.

I am the owner of a large flock of Merino sheep, and have sensibly felt the prejudice against them. This is now very much weakened, so that those sheep sell for double the price they did last year. But still there is enough of it left to afford great encouragement to the introduction of a breed of sheep, of totally different, and I might almost say, opposite qualities. Should not even an unjust prejudice be fostered, when it can be turned to so good an account?

I am, dear sir, with great respect,

Your friend and obedient servant,

W. H. SUMNER.

ON THE GROWTH OF WHEAT.

[To the Corresponding Secretary.]

SIR,

HAVING in the year 1792 seen many large fields of excellent wheat, in the interior of New-York, I had a desire to try that kind of grain on my land, believing that I could raise my own flour. Accordingly I obtained a small quantity of spring wheat, and sowed it on good land, but although there was much large straw, yet the wheat was smutted and

blasted. I then concluded that the season was unfavourable to the grain. The next year I sowed a part of the preceding year's crop, and the result was worse. The wheat was more smutted and blasted than before. Not yet discouraged by the last crop, I sowed the third year on rich land. Suffice it to say, that I had large straw, but it was so smutted and blasted, that it was disagreeable to pass near the piece on which it was sowed, from the stench it afforded while standing. I then relinquished all hope of raising wheat on my farm, concluding that the soil was unfavourable to the grain.

In the year 1812, I was surprised to see, in a neighbouring town, two or three pieces of very good wheat, about fit for the sickle. On inquiry I found that wheat had been raised in that neighbourhood for years, that the seed was obtained from the northward, and frequently shifted, and also, that it was necessary to prepare the seed for sowing, to prevent blast and smut.

In the month of April, 1813, I prepared a piece of land, by well ploughing, for wheat. And with a view to promote vegetation, and prevent smut, the seed was soaked in a strong solution of soap, then limed, and immediately sown. The wheat came from Vermont, and was of that kind which has little or no beard. The crop was good, and without smut or blast to injure it. The produce was at the rate of 16 bushels per acre, and weighed 55 lb. 4 oz. per bushel.

In 1814 the experiment had much the same result. The land sowed did not produce so many bushels per acre, but the grain was better, and yielded 37 lb. 14 oz. of good flour per bushel.

Since which time I have raised wheat almost every year, and with success. The preparation of the seed is of the utmost consequence; I first wash it clean, then soak it in a strong solution of soap, in which a small quantity of nitre, (say half an ounce to a gallon of the solution), is dissolved. I have not been very particular as to the time of soaking the

grain, but a few hours before sowing it, I have added a small quantity of green vitriol in solution. As to the quantity of vitriol, about the same as that of nitre. Lastly, drain off the solution, and add slacked lime, a sufficient quantity to prevent the grain from adhering corn to corn, and sow it immediately.

In 1817 the produce was 20 bushels per acre. In 1819 I sowed a small quantity of Spanish wheat, which I received of B. Guild, Esq. It did well, notwithstanding the extreme dry weather in July, which was an injury to it. The grain was large, but not so white as some other kinds. In 1820 I sowed the same kind, and with success, yielding about 16 bushels per acre. By the politeness of R. Sullivan, Esq. I obtained a quantity of Poland wheat: To this I paid great attention, but only a small part sprung up, and what appeared, was winter grain, and came to nothing.

It is here proper to remark, that in every instance recollected, where I have sowed spring wheat, I have at the time laid down the land to grass, and it is frequently the case that the young clover and herd's grass overspread the ground before the grain comes to maturity; and this is one cause why the crops have not been more abundant.

Respectfully,

R. GREEN.

Mansfield, March 9, 1821.

ON ORCHARD GRASS.

Jamaica Plain, 28th May, 1821.

DEAR SIR,

KNOWING your exertions and success in the *Soiling System*, and having lately read the enclosed piece on the subject of *Orchard Grass*, which appears so admirably calculated to assist in that object, induces me to send it to you for publication in the Repository.

I have cultivated this grass for several years past, at the recommendation of a respectable clergyman in Connecticut, and have been much satisfied with it, if cut for hay before it gets too ripe, but have thought it came up very scattering, considering the quantity of seed sown, (never less than two bushels per acre, and of my own raising). This year, however, in reading the inclosed paper, I prepared the seed as therein directed, and put two bushels on an acre, with ten pounds red clover seed, and it has come up, as freely and as thick as my *Herds'* or *Timothy grass*. It was sown on barley, with *Bennett's* broad cast machine, at the rate of one acre in less than one hour.

Very respectfully, your's,
JOHN PRINCE.

Hon. Josiah Quincy.

[From the Farmer's Magazine for August, 1815.]

In a letter from Mr. WM. FALLA, Seedsman, Newcastle, to SIR J. SINCLAIR,—on Cocksfoot Grass, (Dactylis Glomerata), or, in America, Orchard Grass.

ON the subject of Cocksfoot Grass, I beg leave to make the following observations, which I find I cannot do so well in the way of answers to your queries, as in the manner I adopt. I have for many years dealt in the seed of this grass, with which, till the year 1813, I supplied myself from dealers in London. That year, and the season of 1814, I purchased it, to a considerable extent, of persons who collected it in this part of the country; but not having been able to induce many agriculturists here to make trial of it, the greatest part of the seed has been sent into other neighbourhoods. The results of the few trials that have been made here, have not been favourable; not from any fault in the seed, nor unsuitableness of the ground it has been sown upon; but from its having been sown among corn, generally wheat, and from the seed not having been properly

prepared previous to sowing; without which, particularly, should dry weather happen after sowing, generally speaking, it will not vegetate. It should be sown on well cleaned naked ground, with or without clover, and if the land can be got ready, in the month of March; if not, any favourable time in April will do; previous to which, the seed should be laid on a barn or other floor, and moistened by water out of the nose of a watering-pot, turning it over frequently, and increasing the moisture, if necessary, for at least 48 hours, being careful that no heat takes place. By this time the seed will be well swelled, and the radicle ready to strike; and in this state it should be sown, (the ground having been previously harrowed with a light seed harrow), and then brushed in by some such means as what is called a brush harrow, which is made here by winding thorns through a gate, and the gate laid and drawn horizontally over the land; and finally rolled. The quantity of seed sown per acre has generally been two bushels; which is quite enough, if a few pounds of clover seed are sown with it; but if it is sown alone, perhaps two and a half or three bushels may be necessary; at any rate it will be safer. I sowed an acre this spring, which has succeeded in the most satisfactory manner; while some of my customers, with the same seed, but sown with wheat, and without the recommended preparation, have totally failed. I sold upwards of twenty bushels of cocksfoot grass seed, in 1812, to George Gibson, Esq. of Stagshaw-house, which I presume, for want of proper management, (although he is a very judicious and enlightened agriculturist) totally failed. He was, in consequence, very much dissatisfied, supposing the seed in fault. He having made a serious and second complaint respecting it in the following spring, and my clerk having been so fortunate as to find a sample that had been kept of the seed sent to Mr. Gibson, I sowed a little of it on a single square yard of my nursery ground; and, though one year old, it grew most charmingly. I am thus particular respecting this sample.

yard, because I made it the means of what I think a very interesting experiment. It was sown, as I recollect, in the month of March, on ground that was light, and in tolerable good order, but that had had no manure put on it for several years. The grass was not cut, nor in any way disturbed, that year, as I hoped to have had an opportunity of showing it to Mr. Gibson: indeed I had no intention of making any other use of it. But in the spring of 1814, it had so abundant and beautiful an appearance, that I was, on the 30th of April, (a dry day,) induced to cut and weigh its produce, which I found 16 pounds, amounting to the astonishing quantity of *thirty-four and an half tons* per acre! and that at a period when any other green article, fit for soiling, was not above two or three inches long. I cut it again the 24th June, and obtained 8 pounds; and again the 10th September, when I had 10 pounds, (both dry days); making a total, from the three cuttings, of 34 pounds, equal to *seventy-three tons* per acre.

I observe that wonderful accounts are given of the value of this grass, as used in Norfolk, for sheep pasture, of the truth of which I have not a doubt; but, whatever may be the extent of its value for that purpose, there certainly has been no article yet recommended or used, at all comparable to it for early soiling, the time of all others when such an article is particularly wanted. I must observe, that where cocksfoot is intended for early soiling, it should not be cut or eaten, the autumn before, later than, I think, the 1st September. In the year it is sown, I do not recommend its being cut or eaten at all.

REVIEW OF "A TREATISE ON AGRICULTURE, &c. BY A
PRACTICAL FARMER." "Albany."

[Concluded.]

IN our second number of the present volume we introduced this treatise to the notice of our readers, because we thought

and we still think, that it deserves a high place among our original treatises on this subject.—We did not continue our remarks upon it in our last number, because we make it a rule to prefer original communications of merit, to our own remarks, in which we cannot presume to place as much confidence.

It may be recollected by those who take any interest in our Journal, that we mentioned the author of this tract as a man of shrewdness, of various and extensive reading, and as possessing a more enlarged library on agricultural and physiological subjects than falls to the lot of most Americans. We even ventured to suggest, from the obvious partiality displayed by the writer, in favour of French philosophy and French agriculture, that he probably was a naturalized citizen, an emigrant from France. It is now pretty well understood, that the author is a late ambassador from the United States to France,—and if this be true, we do not think it detracts from the correctness of our opinions founded on internal evidence, as to the character and prepossessions of the writer. From such a source we should expect all the energy, boldness and vigour, which we were ready to allow to the author. His opportunities and his taste led him to form an intimate acquaintance with the state of French agriculture, to enrich his library with all the modern French works on the subject, and if it be true, as we have heard but dare not believe, that he omitted the fairest opportunity ever offered of making himself well acquainted with British agriculture, we can account for his predilection for that of France. It is a systematic plan of the French sçavants to assume every thing as their own—to borrow without returning, or acknowledging the favour.—Much of this spirit has been shown in our former notice of this work, and the same feeling will be discovered in the parts which we are now to notice.

We concluded our remarks on this work in our second number of the present volume, with some strictures on the author's observations, as to a succession of crops as ap-

plicable to the United States, in which he seemed to rely much on Mr. Strickland, who paid us a flying visit from G. Britain and understood about as much of our agriculture, as Weld and Birkbeck and Fearon did of our politics and manners.

We shall now proceed to notice the author's remarks on the plants recommended for a course of crops and their culture.

He commences, as every sensible man will do, with the potato, the first undoubtedly of root cultivation—perhaps in the northern states the first plant in every view except our staple, the Indian corn.—He states the prejudices it long encountered in France, and even its proscription by the government as a deleterious vegetable. He further states that its credit is fully re-established even in that country of prejudices. They now call it “the manna of the poor,” they place it before every vegetable but wheat, and far before cabbages, carrots, and turnips. We are happy to hear this testimony from a nation who thirty years since considered the potato a poison. He says, and says truly, that this is not its whole praise, he might have said it is its least or smallest praise. “It is, says he, of all vegetables, that which from the number, shape and size of its roots forms the best preparation for subsequent crops :” and he might have added, what we shall take the liberty to add, that its tops form the most complete shelter of the soil against the scorching and impoverishing rays of our vertical sunbeams : and at the same time are so fatal to the growth of all exhausting weeds, that if it had no other merit. this alone ought to recommend it to our favour. He might also have added, that its stalks restore to the ground a greater quantity of vegetable matter than any plant with which we are acquainted. It may indeed be considered the restorer of exhausted nature. Another idea has been overlooked, or we might more modestly say omitted by our author—It is the only plant, for we will not except the carrot or parsnip, which compels even the lazy cultivator to break open the soil, and pulverize it, in order to procure his harvest.

In the cereal and grass bearing plants we never move the

soil. In the cabbage and turnip tribes but slightly—but we cannot, let our avarice or indolence be as great as they will, obtain our crop of potatoes without a more complete sub-division of the soil than we can even obtain by the plough.

The potato then is one of the farmer's best friends, and we owe more to S. America for its introduction than for all the gold and silver which its mountains have ever furnished.*

He then informs us, that Botanists count more than sixty varieties, and twelve species of the potato, but for agricultural purposes, he says they may be reduced to three, the *red*, the *white*, and the *quarantaine* or forty days potato—or in other words the early potato, a variety produced by artificial culture.

Who is the Botanist that will dare to limit the *varieties* of the potato to sixty? or who even pretends that of the *solanum tuberosum* there are *twelve* species? We may be mistaken, but we can find in no book in our possession more than one species of the common potato. This however, is of no greater importance than that our writers of talent and learning should not give occasion to Europeans to smile at us. But the other remarks are of serious *practical* importance. It is true, that to agriculturists, there are no distinctions among potatoes but into red, white and early potatoes, or as the French call them *quarantaine*?

What red and what white potatoes are intended? Are they the old cranberry red, long since out of culture because unproductive? Or are they, the River Plate long reds, so different from all others, as almost to merit the distinction of a separate species? What becomes of the real blue potato with a rough skin? Or the modern blue potato of a copper colour with blue eyes, a prolific and popular variety? Of the white with red eyes, called the Lancashire potato? Of the potatoes with yellow skin and yellow flesh, now the favourite

* We know that the potato is popularly given to *North* America, and that Sir Walter Raleigh is said to have introduced it from Virginia. The best naturalists consider it a plant of South America, and we do not know that it was ever discovered growing wild in our country.—Pursh and Michaux did not discover it here. It appears to us clear, that after 200 years, it would have been found in a wild state, had it been a native of Virginia.

potatoes of the north? Ought we on this subject to omit to notice the *asserted fact*, that varieties of potatoes run out in the course of from twelve to fourteen years? Who can find one variety to which he was accustomed in early life?

The long Spanish potato with a pink coloured centre—the round blue rusticoat or rough coated potato, are entirely extinct. They were succeeded by the cranberry or round red potatoe which is also extinct. These have gone out in spite of every effort of art, and of all the prejudices of cultivators. One after another drops them and they disappear to be seen no more. In this region of potatoes, we know well that we change our seed, and that not from choice, but necessity.

We have not made these remarks in a spirit of cavilling or criticism, but because we think it proper our farmers and other intelligent agriculturists should understand, that either by sowing the seeds, or by importations they must, as they always have done, change their seed at least every ten or twelve years.

This writer has never seen more than 400 bushels raised on one acre in our country, but our late journals exhibit instances of 500 and even 550 bushels, though we doubt whether our country will ever attain to the great products sometimes exhibited in Ireland and Great Britain, because the potato loves a soil and *climate* more moist than any which the United States can furnish.

On the subject of the culture of this plant, this writer furnishes few new ideas, but he lends his influence and his powerful and decided language in favour of the practice of planting large, well grown potatoes for seed, in preference to small ones, or cuttings, or sprouts, in which we fully agree with him. We think not only the analogy of all other plants, but what is of more moment, the weight of experience, is on that side of the question. We have, it is true, in the last 30 years, seen many ingenious experiments on a small scale, by which it would seem, that on the whole, cuttings were as good

as large and full grown potatoes, but on a large scale, we have not had one experiment in support of this opinion, and our own experience of fifteen years, and that of our best informed neighbours of far greater experience, would seem to justify the employment of the best potatoes for seed. We are persuaded that thirteen bushels to the acre of full grown and large potatoes, will amply reward the cultivator for the additional expense of seed.

We cannot concur with the writer in the slovenly and dangerous practise of harrowing the potatoes after they are out of the ground, in order to extirpate the weeds, still less in the repetition of that experiment with a narrower barrow.

The plough, and the hoe even when potatoes are cultivated on a large scale, we believe to be much more economical.

The next article of culture, mentioned by the author, is Rye. Though inferior to wheat, there are some circumstances under which he thinks it may have a preference ;—these are, “ 1st, it may be raised in soil where wheat cannot.”

2d, “ It bears a much greater degree of cold than wheat.”

3d, “ It goes through all the *processes* (or as the writer too quaintly expresses it) all the *phases* of vegetation in a shorter period, and *of course exhausts* the soil less,” (a non sequitur or false consequence as we think.)

4th, If sown early in the fall it gives a great deal of pasture without *much* eventual injury to the crop, (this also requires accurate investigation before we decide,) and 5th, “ Its produce from an equal surface is one sixth greater than that of wheat.

These circumstances render it precious to poor soils and poor people, to mountains of great elevation, and to high northern latitudes.”

These remarks are certainly just.

Its use as food for horses, he remarks, is well known in this country and Europe. The grain and straw chopped and mixed, forms the principal horse food in Pennsylvania.

It follows potatoes in a course of crops in poor lands.—He recommends early cutting—“ cut two days too soon rather

than one day too late," is quoted as one of the precepts of Cato, and we believe it would save many crops of wheat as well as rye.—It seems of late to be a very fashionable doctrine in the wheat countries of Europe.

The next article in a succession of crops noticed by the writer under review, is Turnips, and here we would respectfully suggest, that, with the exception of the yellow turnip or *ruta бага*, we doubt whether in the northern and middle states, we shall ever be able to introduce the turnip to advantage in a succession of crops. It has always appeared to us to be one of the cases in which we have followed the European cultivation, without a due attention to the difference of our climate. That turnips may be raised in favourable years, in great quantities, after a culmiferous crop, has been removed, we have no doubt, but as we can seldom if ever feed them on the ground, owing to the severity of our frosts, we doubt the economy of this culture. The common turnip is kept with difficulty, deteriorates by keeping, and is in all cases a very indifferent species of food.

Our author speaks of two methods of cultivation, one for the purpose of ploughing them in as manure, the other of raising them for food. The first object has never, so far as we know, been pursued in New England, and we should doubt whether in a climate so cold, we could turn them in to any advantage, after a crop of grain had been taken from the soil.—They would, we should fear, not be sufficiently rotted to be of much use in that way. To protect the turnip against the fly, its mortal enemy in its early stages, he recommends the use of ashes, the well known and constantly employed remedy—and he suggests, in a note, that on a small scale, the water in which potatoes have been boiled, has been thought a protection against this destructive little insect.

With respect to the Swedish turnip or *ruta бага*, the author candidly admits that his experience is limited, and we should think so, since he quotes Mr. Cobbett's experiments as having tended to recommend the plant, and seems to be ig-

norant that we had been for several years before Mr. Cobbett's experiments were pompously announced, in the practice of raising this root on a pretty large scale. It is, without question, the best of the turnip family, though like all newly introduced plants, it has had many extravagant things said in its favour.

It will not in general produce very heavy crops, but it is very nutritious—a great favourite with cattle, and except with milch cows at the time of their giving milk, on account of its effect on the taste of the milk, a very excellent food. It keeps better than any known vegetable, and retains its goodness till new vegetables appear.

The next article in the succession of crops noticed by our author is Barley. It is, as he remarks, very valuable as being adapted to the greatest variety of soil and climate, less subject to the attacks of insects and more easily preserved. This undoubtedly is the reason why it has been, and will long continue to be, the favourite plant to introduce our clover and grasses. It is, he says, a food on which cattle do well, and on which horses *arrive at the greatest possible perfection*. This fact is new to us. It is with us principally employed in the breweries.

The author then proceeds to the consideration of clover, our most valuable grass, and he adverts to a quality which is, we fear, little known in our country, notwithstanding the efforts of Colonel Taylor and other ingenious cultivators, we mean its ameliorating effects on the soil.

He says it is but about two centuries since it first became an object of agricultural attention as forage, or food for animals, but that its beneficial effects on the soil, owing to its peculiar system of roots and leaves, were known only very recently. He does not explain the manner in which it thus operates, but we conceive its principal effects are to be attributed to the multiplicity and breadth of its leaves; the density of its foliage, which protecting the earth from our scorching suns, and checking by its very rapid growth the progress of

other plants, prevents the exhaustion of the soil, and of the manure put upon it, by evaporation. We can scarcely conceive, that it operates in any other way, and it is principally to the same cause we are to attribute the excellent effects of a potato crop.

The ideas, which this writer suggests as to the culture of clover, which may be thought either new, or deserving experiment, are, that ten or twelve pounds of clover seed are sufficient* in an acre of rich land, and if poor, double that quantity, and that the practice of mixing the seeds of timothy (our Herd's grass) and rye grass is a bad one, because these grasses neither rise or ripen at the same time. Another bad practice, he says, is, to sow the clover with the winter grain, when a large proportion of the seed inevitably perishes.

We must own, that we have for many years doubted whether our treatment of clover was judicious. It is most certainly contrary to the practice of European cultivators of the highest intelligence. The clover is a biennial plant. It would seem to us to be best to treat it as a separate crop; and to follow it either by some species of grain, or potatoes, and to sow our herd's grass and other grasses by themselves. I know well that our system is a seven years one, or at the least five years. That we do not relish the breaking up our land at shorter periods. Finding the clover runs out the second or at the utmost the third year, we are tempted to mix with it a more permanent grass; but we do not inquire whether both grasses are not injured by the mixture.

It is certainly true that the clover is ripe for the scythe a fortnight before the herd's grass, and it is equally true that the clover must injure the herd's grass—but as we are most resolute not to employ the plough oftener than we are absolutely compelled to do, we prefer the mutual injury which these plants, so unlike each other, produce, to a system which would give us more hay, and a more equal crop.

* We usually sow not more than six pounds.

On the subject of the time of cutting clover, our author remarks, 1st. That clover cut before it is in flower, abounds in water, has but little nutritive matter, and is apt to produce indigestion in cattle fed upon it.

2d. Clover cut after seeding, is hard and woody, and no longer retains its leaf; and, 3dly, all plants cut after seeding exhaust the soil, and to this rule clover is not an exception.

From these rules the author concludes, that the short period between the flowering and seeding of clover, is that in which its use would be greatest, either as food or as an ameliorating crop.

This, we are fully persuaded, is true, without qualification; and we hope, and believe, that the opinion is gaining ground. Perhaps the best rule to adopt, as a general one, is to cut this plant when about one third of its flowers begin to turn.

He recommends the Dutch practice, as to saving seed of the clover where the *first* crop is cut before it flowers, and the *second* is reserved for seed.

He states two modes of getting in, with safety, a clover crop, the most difficult of any to make into good hay. The one to scatter over each load, when put up, two or three quarts of salt, the other to interpose between every two layers of clover, one of clean straw. By the first the whole mass is rendered acceptable to cattle. By the second the quantity of nutritive forage is increased, and by both the clover is effectually prevented from heating.

Of wheat, with the culture of which we should have expected the author to be extremely well acquainted, very little is said, and of that little nothing that is new, except a pretty strong assertion that Tillet, Tessier, and other French philosophers *have shown* that smut and charbon in wheat are *produced* by an intestinal parasite of the Uredo or mushroom family. We have understood, that this question is not yet at rest. Sir Joseph Banks, indeed, has proved that a

parasitical fungus is found on the wheat plant, but it is wholly different from smut or charbon, and the causes, as well as preventive remedies, are not yet settled, though all cultivators recommend the washing the seed, differing exceedingly, however, as to the solutions in which it should be washed, some preferring ley from ashes, others brine, and others a solution of various other salts. We were much disappointed in this part of our author's treatise.

Of the culture of peas the writer speaks favorably; is of opinion that they are not an exhausting crop, but on the other hand, by stifling weeds, and checking evaporation, and finally, by being ploughed in, they ameliorate the soil. He is of opinion that they may with advantage be mixed with more erect plants, such as rye and oats. He recommends feeding them on the ground by hogs, by which much labour is saved. No manure is lost. What is refused by the hogs is given back to the soil, and the rooting of these animals in this case is beneficial.

Indian corn is next introduced. We shall notice only such remarks of the writer as are either new, or, if not new, merit to be enforced by the weight of new authority. The seed should be taken from the finest ears of the last year's crop, and from stalks which produced the largest number of ears. The seed should be steeped 24 hours in a strong solution of nitre (saltpetre) before it is planted. (This, we believe, is not with us a general practice.

He says, very little difference in results is produced by the different modes of planting in furrows, in hills, in distant rows, with potatoes or mangel wurtzel between. The greatest success we have heard of has been in furrows, and cultivation solely by the plough. We allude to the case of the Hon. Mr. Hunewell, to whom our highest prize was awarded last year. "Corn is sometimes cultivated as fodder only, in which case it is generally sown, broad cast, at the rate of ten bushels to the acre, and *cut green*. In the volcanic soils of Italy it sometimes produces four green crops in a year."

We think the writer must have been mistaken in the quantity of corn sowed broad cast on an acre. We are persuaded that from two to three bushels would be ample ; better than a larger quantity. The Hon. Mr. Quincy has tried the Indian corn as green fodder, and with success, though he was not able to obtain more than two crops in a season. If we shall ever adopt, extensively, the system of soiling, or feeding our cattle in the barn in summer, the Indian corn will be invaluable to us as green food. Of Beans little is said, except some praise of the Heligoland bean, which seems to do better every where than with us in New-England. Of the cabbage, as one plant in a succession of crops, our author speaks in great praise, and it will be seen by our last journal that it is cultivated in this part of the country with great success. We do not think, however, that the objection of the difficulty of preserving them is sufficiently obviated by the writer upon the authority of Mr. Cobbett. We hold that authority very cheap. He was a bold and lively writer, but one whose accuracy cannot be relied upon. In the vicinity of the sea coast the cabbage can be well preserved by a covering of sea weed ; but in the interior we fear it would be difficult to find a covering which would not prove too expensive. On Buckwheat, which is the only article remaining under the head of a rotation in crops, little is said which is not well understood.

Among the plants which may be occasionally raised in a rotation of crops our author enumerates madder, woad, the poppy, the sun-flower, the palma christi, and flax. Of the five first we would only remark, that they can never enter into a general system of agriculture ; and it may well be doubted whether we can, in the present state of our cultivation, while our intercourse with Europe is so open, raise them to advantage. We are surprised to find the important staple of flax placed among these rare plants which require so much capital and time for their preparation for the market. Flax, it seems to us, claims an eminent place among

our staple productions, and ought to be raised on every extensive farm which furnishes land suited to its cultivation. Our author makes but few remarks on this invaluable plant, but our readers will find this deficiency amply supplied by the learned and elaborate treatise on that article, at the head of the present number.

Some mention is made of the New Zealand flax. It is not flax any more than it is hemp, and it bears no resemblance to either, though applicable to the same purposes, and perhaps more valuable than either of them.

Our author says it has been naturalized in the north of France. If this beso, it may be raised in N. England, or at least in the middle states. This Society will feel much indebted to any citizen of the United States, who will introduce the plant or its seeds from New Zealand or from Europe. We ought to say, in compliment to an intelligent gentleman of Roxbury, Capt. Dorr, that he brought home from New Zealand, beautiful specimens of the prepared flax or plant fit for spinning, and also seeds, which however, owing to the length of the voyage, did not vegetate. We would suggest to our patriotic mariners, the expediency of sowing the seeds in a box or pot, and bringing home the live plant as well as the seeds. The seeds are best preserved in dry sand.

We had intended to go on and furnish a perfect analysis of this work, instead of a review, as such works are commonly conducted, because we believed that in so doing greater good would be produced, and a greater number of persons be induced to purchase and read this work. It has its imperfections, as we have attempted to show, and what work has not? And what original American work of so small a compass can be found, which contains such a variety of matter, and so complete a system?

It is calculated, and probably was intended, principally for the better informed class of cultivators,—to excite a spirit of inquiry and research, rather than to give a perfect manual of agricultural labours and duties.—As such we cordially recommend it to our readers.

Leominster, May 10, 1821.

MY HON. FRIEND—*Sir*, As I have had some conversation with you on agricultural pursuits, and knowing your laudable ambition to encourage the same, I take the liberty to communicate a few lines to you on the raising of potatoes ; and should you think the following method of raising potatoes would be more useful than those now generally used, and that it will tend to subserve the interests of agriculture, you are at liberty to make what use of it you please.

The value of potatoes was but little understood by our ancestors. My grandfather, since my remembrance, observed that he raised, in one year, six bushels of potatoes, but found so little use for them during the fall and winter, that he threw away one half of them in the spring.

They are now, however, so highly esteemed, that it is not uncommon for a farmer to raise from two to four hundred bushels a year.

To ascertain, therefore, the best method of raising them, as it respects both the quantity and quality, will not, it is presumed, be thought unimportant.

The method by which I was taught to raise them, and which I believe is now too generally practised, was, to plough the ground very deep, make deep furrows, so as to receive a large shovel full of manure, then to plant them upon the manure, and to cover them very deep with earth. After they had come up, I was taught to plough deep between the rows, and hoe the earth round them, so as to make large and high hills. From the following facts and observations, I am fully convinced the above method is wrong.

About twenty five years past, I ploughed a piece of wet-tish land, covered with small bushes, for the purpose of subduing them, owing to the roots of the bushes, I was unable to plough deep, or make deep furrows, the manure was put on the top of the furrows, the potatoes placed upon that, and earth carted to cover them, whereby they were but thinly

covered with earth. After they had come up, they were hoed several times before they blossomed, the earth each time loosened from the roots, and replaced by a little fresh earth, but not so as to make the hill large. In the fall, after the frost had bitten the tops, but killed the fibrous roots, they were pulled with ease, not being deep in the ground, and shook between the rows, where they remained in the sun two or three hours, they were then carried into the cellar; and, not expecting them to be so good as some I had raised in the common way, intended only for the use of the cattle, but the family, not knowing this circumstance, used them a number of times to eat, and finding them remarkably sweet, mealy and palatable, led me to an inquiry into the cause:—being unable to account for this in any other way, than their not having been planted and covered deep in the earth, I was determined next year to try the experiment, which I did in the following manner.

A part of my potatoes were planted as usual, and a part were planted near the top of the ground, covered but thinly, and afterwards hoed so as not to make large or high hills. In the fall, those potatoes planted and cultivated in the manner last mentioned, were far more sweet and palatable than the others.

Since that time I have planted and cultivated my potatoes by the following rules:—

1st. Plough the ground but a few days before the potatoes are planted, because otherwise it will settle and become hard.

2d. Furrow the ground for the purpose of making a mark where to place the manure for each hill, about four feet apart, so as to let the rays of the sun in between.

3d. If the land be moist, the manure should be of a light or strawy kind, if dry, it should be finer, or of a moister nature, and the furrows a little deeper.

4th. After the manure is placed, drop the potatoes on it, covering them thinly, and taking care that no rocks or sods

be placed on them, but place the rocks or sods near the potatoes for the purpose of letting in the air.

6th. Soon after the sprouts shoot through the ground, plough between the rows with a horse, as near the roots as possible, clear out all the weeds from the potatoes, and add a small quantity of fresh earth to the roots.

6th. At the last ploughing, (which should be before they blossom, otherwise there will be a new set of sprangles, which will cause the growth of a large number of small potatoes,) clear out all the weeds, and placing a little fresh earth round the roots, making the hills flattish, but not high ; in this way, small showers, and even common dew, will afford nourishment, and increase their growth, I keep the ground clear of weeds by pulling them up whenever I see any come up among the potatoes, so that the air and the rays of the sun will easily penetrate to the roots and render them more sweet and mealy.

7th. In the fall, before the roots are dead, they should be dug, shook between the rows, and remain two or three hours in the sun, (for potatoes should be dug in fair weather,) then carried into the cellar, where, to prevent their becoming strong and bitter, they should be kept as much from the air and moisture as possible. I gave this information to my neighbours and friends, and they say it is the best method of raising potatoes ; I also wrote to Dr. Adams, who published the Medical and Agricultural Register, in Boston, in 1806.

Your friend,

BEZALEEL LAWRENCE.

Hon. Josiah Quincy.

INTERESTING AGRICULTURAL CORRESPONDENCE BETWEEN G. W. JEFFREYS, ESQ. OF NORTH CAROLINA, AND COL. JOHN TAYLOR, OF CAROLINE, VIRGINIA.

[From the American Farmer.]

QUERIES ON PLASTER OF PARIS.

PROPOUNDED BY MR. JEFFREYS.

THE following are the queries, to which Col. Taylor has annexed answers on plaster of Paris; (See his letter.)

What quantity to the acre have you generally used?

On what soils does the plaster succeed best?

In what way is it best applied to the soil—with, or without ploughing—with, or without other manure?

Have you repeated the application of it? At what intervals, and with what *effect*?

To what kind of grain, succulent, and leguminous crops can it be beneficially applied? And in what way is it best applied to them?

To what kind of grasses can it be beneficially applied? and in what way is it best applied to them?

What has been the increased product per acre, of grain and grass crops, by means of the plaster alone?

What is the result of the experiment which you have made of setting aside 200 acres, half to be cultivated in corn yearly and alternately, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre.*

* For fear this experiment may not be understood by the question, I will give it more fully in Col. Taylor's own words, "I have set aside 200 acres, (divided into two fields,) half to be cultivated in corn yearly, half to lie uncultivated and ungrazed, and the whole to receive an annual dressing of one bushel of plaster to the acre. The repetition of the culture being too quick for a pereunial plant, I use the bird-foot clover, as we commonly call it, to raise clothing for the land, having found that the plaster operated as powerfully on that as on red clover. One field produces a crop of corn, and the other being enclosed, re-

COL. TAYLOR'S REPLY.

Port Royal, March 4, 1818.

DEAR SIR—To your questions of the 4th inst. I reply—

1. I sow from three pecks to one bushel of plaster upon an acre.

2. It succeeds upon all soils to which I have applied it; those requiring to be drained excepted.

3. Sown on clover in the spring, it benefits it considerably. Used in any other mode, I plough it in. But I have even discontinued the first practice, from observing, that when plaster is sown and ploughed in with wheat in the fall, a top dressing to the subsequent clover is of little or no use; and from thinking that the effect of the plaster sooner ceases as a top dressing than when ploughed in. The best ways I think of using it, are in the Spring, upon the long manure of the preceding winter, to be ploughed in with it—upon well covered fields to be sown immediately before they are fallowed—in rolling it very wet with seed corn bushel to bushel, and in mixing it with seed wheat so moist as to let the wheat divide in sowing, in such a quantity as that the land shall receive not less than three pecks to an acre. The latter is chiefly for the sake of the succeeding clover. The wheat is benefited in a very small degree, but it prevents embezzlement of the seed.

ceives a crop of ungrazed vegetable matter.—The succeeding year the ungrazed field is taxed with the crop of corn, and the corn field fed with the ungrazed vegetable. In one, the plaster is sown upon the bird-foot clover in March or April, and in the other ploughed in at its fallow. The object of the experiment is to ascertain whether an annual bushel of plaster to an acre, combined with a biennial relinquishment to the soil of its natural vegetable product, will enable it to be severely cropped (cropt) every other year without impoverishment, or with an addition to its fertility. The first effect would suffice to check an evil, every where demonstrating the wretched state of our agriculture; the second would be a cheap and expeditious mode of improving the soil, even where the state of agriculture is good."

G. W. JEFFREYS.

4. I have had a small mill exclusively for grinding plaster during twenty years. In that period I have used several hundred tons, and tried a great variety of experiments, using it every year to considerable extent. I think it a valuable ally of, but by no means a substitute for manure. That there should be intervals of two, three, or four years, between applying it broadcast to the same land. That its effect is graduated by the quantity of vegetable matter upon which it is sown. That upon close, grazed land, it does but little good at first, and repeated, would become pernicious; and that it must be united either with the long manure of the winter, or the ungrazed vegetable cover produced in summer.

5. Corn mixed with plaster is sometimes highly benefited, and almost unexceptionably in a degree, depending chiefly on its alliance with vegetable matter, and occasionally upon the seasons. Its effect upon wheat is before stated. But all crops are ultimately improved by its gradual improvement of the land, including those upon which its effect is not immediately visible. The small crops, vegetable, succulent, or culmiferous, are often benefited by a mixture with plaster, when planted measure for measure.

6. I have satisfied myself that plaster ought to be used to benefit all kinds of grasses, in the modes explained, and that it ought not to be sown as a top dressing. By improving the land, it benefits all kinds of grasses.

7. It is impossible to say how far the plaster, valued exclusively of its vegetable ally, may have increased the crops of grain. Used as a top dressing to clover (red) on land never before plastered, I have often had that grass increased four fold to a line, dividing it from similar land and clover. Spaces left unplastered across large fields, when sown in wheat, have remained visible during the whole season of rest, by the inferiority in luxuriance of a great variety of natural grasses and weeds. The 200 acres you mention have never received any manure, and the corn stalks

have been taken off. But they have been completely secured against grazing. They now produce threefold more corn than when the experiment commenced. The rest of my farm, having had the manure, will produce five fold more corn than it could do twenty years ago. The casualties attending wheat, render that a precarious criterion of improvement.

I am respectfully, Sir,

Your most obd't serv't,

JOHN TAYLOR.

ON FERTILITY.

[From the English Commercial and Agricultural Magazine for 1800.]

OMITTING (as at present unnecessary) all disquisition about the component principles of fertility, it seems certain, that Fertility can be induced only by the agency of the air. Among the wondrous modifications of this element, it would be dangerous to assert that, *in some shape*, it is not the actual food of vegetables: to vulgar comprehension it may be proved, that at least it is the *Carrier* of fertility.—In either case the result would not be different.—That air is an accessory to fertility is evident; because vegetable earth* dug at a considerable depth (in sinking a well for instance) produces nothing without considerable exposure:—because, on examining any section† of the Strata under us, though they are seldom horizontal, and still seldomer according with the inequalities of the surface, yet that surface, to a certain depth, is uniformly tinged with a dark colour. If it be urged, that this alteration of colour only results from the decayed generations of vegetable matter through the revolutions of ages, I answer, that roots will follow vegetable earth

* Our language furnishes a word which expresses this complex idea: *Mould*.

† All cliffs on the sea-coast give opportunity enough for this examination.

much deeper than this dusky appearance; and that the roots do not penetrate deeper, because the external influence of the air has not been able to endue the earth with previous fertility beneath the accustomed limit. Again, the constant experience of the utility of fallowing land, is a proof that reiterated exposure to the air is practically a cause of fertility—and there are ancient experiments which have demonstrated that the most sterile Clay may be rendered most fertile by grinding into impalpable powder, and exposing it (thinly spread) for a twelvemonth to the influence of the atmosphere.—It is also certain, that Air and Earth mutually transmit fertility, like the transmission of heat and cold in all bodies in contact; or at least, that there is a certain point of saturation of fertility, beyond which exposure to the air constantly carries off the overplus.—In the case of fresh dung, exposure soon lowers the fertility of its surface down to this point of saturation; and the process of the transmission of some volatile substance is disagreeably sensible to the nostrils. To use a chemical illustration, one might compare fresh dung to warm water saturated with salt; as supervening cold expels all the salt, beyond the quantity soluble in cold water; so supervening air carries from dung a certain quantity of fertility beyond that point which may be compared to the cold saturation of water with salt.—I would infer that air is an agent which continually extracts fertility from all putrescent bodies, and as constantly deposits it on its appropriate recipient, Mould. That like all other affinities, this deposition is far more rapid and copious on Mould, which possesses little previous fertility, than on that which possesses much.—The farther removed the mould is from the point of the saturation of fertility, the more greedily is fertility imbibed by it. Be it remembered, that between Air and Mould is no transmission of fertility where there is no contact.—That the middle of a dung heap retains its foetid activity on opening; and much *more* safely is fertility retained by mould, which is never half-saturated.

The beneficial operation of fallowing may therefore be thus described: The external surface (having received an accession of fertility from the air) is mingled with the other mould as deep as the plough goes—a surface (mostly) new results, which in its turn is fertilized; and thus successively the mould is enriched according to the repetitions of ploughing, or other mode of admixture.—But, according to the foregoing theory, less and less fertility is induced at each fresh exposure, as the improving mould accedes nearer and nearer to the limit of fertility, and if (instead of exposing a surface already partially fertilized) it were possible to cover the old surface with successive thin coats of *sterile* mould, the first acquired fertility would remain under ground in store, (κεκμηλιον), while the acquisition of new fertility would go on with the utmost possible rapidity from the unsated voracity of a more hungry surface—and the oftener such surface was renewed, the faster would be the accession of fertility—“But such superinduction of sterile surface is impossible:” it is so; but it is not impossible to pursue the principle to an efficient extent in practical agriculture by a very obvious and easy expedient. This consists merely in ploughing to a greater depth than is usual. Suppose (for instance) six inches, the usual depth, augmented to nine inches, the new mould laid on the surface by the plough would rapidly imbibe the influences * of the air; and if the less laborious sorts of culture, harrowing and rolling, were sedulously employed to increase the imbibing surface of this new mould by pulverization,† it seems not doubtful that, in the course of a summer, this new mould would imbibe much more fertility

* The effect of a *change of air* on the human frame is proof enough of the powerful mutual action of air and mould; for as the air is so constantly moving, it can only be the immediate impression of the contact of the last hour or two, that stamps the discrimination. That contact must needs be very efficient.

† A clod of a cubic inch may be supposed to increase the surface accessible to the air *tenfold* by pulverization.

from the air, than would any exposure of mould already tolerably fertile. This for the first year: afterwards no separation of the old and new mould could be effected; but the increment of fertility would still be greater than under the circumstance of shallow cultivation. For, if after an exhausting crop, two fields ploughed to the different depths of six and nine inches be left equally impoverished, the total remaining fertility of the nine inches equal to the total fertility of the six inches: it is evident that *each component part* of the first must be poorer as 3 to 2; therefore every surface of the first must be more attractive of fertility in that proportion; and, in the successive exposures of cultivation, the same comparative ratio of improvement from the influence of the air must result *ad infinitum*. On the whole, I would argue,—that the passing air is the general cause of fertility; that a *greater* quantity of this beneficial influence will be imbibed by the poorest mould; and that deeper cultivation is a very possible expedient for presenting sterile mould for this more rapid imbibition of fertility.*

The objection against deeper cultivation is of a temporary nature; that it will bring into vegetation those seeds of weeds which are every where buried in the earth; and though these are usually slight annual weeds, some additional labour is required for their extermination. As to the constant additional labour of deeper ploughing, it repays itself as acting as an insurance against the injurious effects of drought and rain. In a drought the lowest roots will supply more moisture than usual from their deeper situation; in excessive rains, the upper roots remain considerably less

* To what can the superior fertility of gardens be attributed, except the deeper action of the spade than of the plough? The larger quantity of dung which is sometimes bestowed on gardens is due to them of right; for they produce *more* vegetables, the immediate origin of more dung. Their superior vegetation is indeed augmented by dung; but that very dung has been produced from their deeper cultivation. Every thing has a right to its own re-actions.

drenched than usual; because, in tenacious lands, water sinks immediately to the bottom of the ploughing, and its detention, at nine inches from the surface, leaves a drier situation for the upper roots than if it were detained at three inches nearer to them.



ON A MODE OF DESTROYING INSECTS.

Dorchester, April 26, 1820.

DEAR SIR,

I TAKE the liberty of indicating a method of destroying the rose-bug, and other winged insects, which are such nuisances in our gardens, and so destructive to the tender shrubs and plants, which was suggested to me by the following occurrence. Going into my garden one summer evening, with a lanthorn, to gather sallad, I found, on my return to the house, that the lanthorn was covered with rose-bugs and other insects, which had been attracted to it by the light. This simple circumstance led me to the inference that *the propensity of moths and all winged insects to fly at a light, will furnish us with the means of at least diminishing their number by suffering them to become SELF-DESTROYERS.*

It is well known how troublesome they are by thronging our rooms in the evenings, where a candle or lamp is burning; how they fly round it, and scathe their wings in its blaze; and how they pelt against the windows, which we are obliged to shut in order to exclude them. Now, I conceive, that availing ourselves of this lure, we might kindle small fires in different parts of our gardens, near the vines particularly, which are annoyed by these voracious depredators, *and they would precipitate themselves into the blaze.* A kind of flambeau might be made, by winding round one end of a stick about a foot and a half long, old rags, or swingled tow, dipped in tar or melted brimstone. Let this be stuck into the ground, and set on fire with a candle; and

it will continue burning a considerable time, and prove the funeral pyre to myriads. These lights might be so placed as not to injure the adjacent plants, nor endanger surrounding buildings, as no sparks would fly from them; and, if any fears are entertained, they might be watched till they were burnt out, and the effect would be thus ascertained, in order to justify the repetition of the experiment.

I have often found the difficulty of freeing my plants from the ravages of insects, especially of the *coleopterous* class, because they have a kind of coat of mail covering their wings that sheds off whatever is sprinkled over them with the purpose of destroying them, and because they occupy generally the under sides of the leaves, or frequent high branches where they are inaccessible: but they would be tempted to fly down to a blaze. The various kinds of *moths*, (parents of most destructive broods,) and the winged *aphides*, those great destroyers of the grape vine, would more certainly be lured by a bright flame to inevitable destruction.

Perhaps a flambeau, at the end of a long pole, might be held up near to apple trees when in bloom, and be the means of destroying many of the small flies which deposite those eggs in the opening blossom that form the worm generated in the core of the fruit.

In the early summer I have observed immense swarms of minute black flies, just at evening, around the plum trees; and suspect them of being the occasion of those galls, or excrescences which occasion such injury to the tree. If so, the expedient which I have suggested, may be tried to advantage upon them.

These remarks are, perhaps, too trivial to be communicated to the public in the *Agricultural Repository and Journal*. If, however, you think that they may serve to suggest expedients to those who have leisure and opportunity to make the trial, you will please make that use of them.

With affectionate regards,

Your friend,

THADDEUS MASON HARRIS.

MR. DERBY ON THE GROWTH OF EARLY POTATOES.

Salem, Dec. 1, 1820.

DEAR SIR,

OBSERVING the produce of a few potatoes, which I transplanted the last year, to be very good, I was induced this season to try the experiment upon a somewhat larger scale. About the first of April I took some late white potatoes, after cutting them, placed them in a hot bed, as close as they could lay, and covered them with earth. On the 24th of April, the plants being in fine order, some of them twelve inches high, I took them up and separating all the shoots but one from the parent potato; I made drills about three feet apart with a hoe, and filling the same with well digested manure, I transplanted as I should cabbage plants, the whole of the shoots about nine inches apart in the drills. On the 3d of May, there was a very sharp frost, which injured the tops of the plants very considerably, they in a few days recovered, and grew very rapidly, scarcely one of them failing. The rows were twice hoed. On the 30th of June I commenced using new potatoes, the size large, and very fine, equal to any taken up in October: finished digging them on the 10th of August; the land measured 90 by 52 links of the chain, on which stood one pear, and one plumb tree, and produced at the rate of 293 $\frac{3}{4}$ bushels per acre. The rows might have been much nearer, consequently the produce would have been greater. I could not perceive any difference in the yielding of the plants, between those which were separated, and the ones which adhered to the potato. Should I try the experiment again, I should take all the plants from the potato, and replant it, as it appeared as fresh and sound as the day it was first put into the ground.

E. HERSEY DERBY.

Hon. Josiah Quincy.

MR. JACKSON ON WHEAT.

Plymouth, Dec. 6, 1819.

DEAR SIR,

FROM the known interest your take in the agriculture of the Commonwealth, and the influence your situation, as one of the trustees of the society, so justly gives you, permit me Sir, to suggest some reflections on the importance of a more general attention to the culture of wheat, an object which the society has deemed worthy its patronage, and for which it annually bestows its bounty: but I imagine something more particular and personal is necessary to produce the effect that is desired, and all that is practicable; there is a prevailing prejudice, an unfounded opinion, among the farmers, that it is an *uncertain crop*. I think too much pains cannot be taken to eradicate such an opinion, without which the premium bestowed by the society, will be, but of partial benefit; there are some persons who always raise this crop, and he who fortunately succeeds in raising the best, will also obtain the premium from the society; but *almost* every farmer ought to raise the wheat for his family, and not be dependent on the southern planter for his bread. I say ought, from the conviction, from actual experiment, that it is as certain, and the most profitable crop, he can raise, and at the same time the least injurious to the land. Any land which is suitable for upland mowing, is also suitable for wheat; and with no grain does the grass seed take so uniformly well.

The land I cultivate is a stiff loam, not dissimilar to the land which was ploughed at Brighton, at the ploughing exhibition, but not so moist. The rotation I observe is (whether on pasture land or mowing,) from the green sward, to plant two years with potatoes, or with corn and potatoes, always following the potatoes with wheat and grass seeds; my crop is from 18 to 25 bushels to the acre: the two years while

planting, I manure the ground well in the holes, say 25 tons to an acre ; when I sow the wheat, and grass seeds, I put on no manure, except some part of the field is very cold, in which case I spread on a light dressing and plough it in.— When the land is in high order I consider it as injurious to the crop of wheat, to manure it, as it forces the straw too much, and occasions it to lodge, although it may benefit the after growth of grass. In preparing the seed for sowing, I adopt no precaution, more than that of soaking and liming, which I believe is the general practice, from the repeated notices, as published in the journals of the society, and which, I think, is an effectual security against smut, (except the seed sown is smutty) : I have never had my wheat affected with it, in the smallest degree ; although I have seen that which was sowed with the same precaution, of soaking and liming, so smutty, as not to be worth the reaping—but the seed that was sowed, was as bad as the crop ; which was conclusive to my mind, that although liming was a *preventive* against smut, it was not a *remedy*, “ for such as you sow so shall you reap :” too much care cannot be taken by those who would reap clean wheat, to procure the seed that is perfectly clean. I will not undertake to say, that smutty seed cannot be cleansed, by care, and frequent ablutions, and rubbing, but it is far easier to procure that which is clean, and then preserve it so by care. Through the goodness of Nath’l Gilman, Esq. of Exeter, I obtained in the fall of 1816, a bushel of seed wheat, the species, he obtained from one ear, which he fortunately obtained from a person who brought it from some port in the Mediterranean, the grains of which are remarkably large, and fair, each weighing down three grains of our common wheat ; it has been sowed in this country 7 or 8 years, and has never, yet been affected with smut or mildew. I have sowed it two years, the first year I had fifteen and a half bushels from three quarters of an acre, sowed in an orchard ; the present year, I had twenty two and a half bushels from an acre, the season was not considered good for English grain generally, being

too hot and too dry ; mine suffered considerably from the drought. I shall feel myself happy to distribute this seed to any person who desires it, as I consider it an invaluable acquisition to the country, and to the agricultural interest particularly.

WM. JACKSON.

P. S. My brother, from three quarters of an acre, the present year, raised twenty six and a half bushels, being the rate of thirty five bushels and ten quarts to the acre : he would have applied for the premium, if he had had an acre.

COMPARISON OF THE STATE OF VEGETATION IN THE SPRING FOR SEVERAL YEARS PAST.

WE have published at different times in this Journal accounts of the progress of vegetation in the early part of the season. We have been incited so to do, partly by the example and authority of many eminent men, such as the celebrated Linnæus, the Hon. Daines Barrington, and others, and partly by the hope, that it might throw some light on one of the most important subjects of agriculture, the proper times of sowing and planting. We are aware, that no direct and immediate inferences can be, in our present state of knowledge, drawn from such an history of vegetation. It may require the experience of many years, a collection of a great variety of facts, to enable us to deduce safe conclusions ; and perhaps, after all, our efforts may prove to be unavailing, and we may be compelled to trust our agricultural measures, in this important point, to chance, or to the elements.

Still, however, it must be admitted, that a collection of facts must be the only sure foundation of enlightened theory and practice ; and it is not in our power to say, that certain useful rules and principles may not hereafter be deduced from such a record of facts.

It is at least a very amusing exhibition of the course of nature, and it tends to show a great uniformity in her operations. It checks presumptuous assertions and complaints of the inequality and irregularity of the seasons, and tends to convince us that the author of nature governs by laws, less variable and less capricious than disappointed or impatient cultivators are apt to imagine. We shall give the time of flowering of various trees and plants for a period of eight years, with some few exceptions, in which our records were imperfect. The correctness of those which we have inserted may be relied upon. The period we have fixed is that of the *first* opening of *any* flowers, however few, on the plants or trees in question. The reason of our adopting this rule will be obvious to every intelligent observer, since almost all the trees in question continue from day to day opening more and more flowers for a period generally of ten or even twelve days, and, if you should wait till the trees were most fully in blossom, it would be very vague, and different observers would vary at least eight or ten days in their respective accounts, though if they had adopted the rule of stating the time of the first fully expanded flowers they might be found precisely to agree. Another remark of some importance should be made. We not only have made our observations on the same kind of tree, but on the same individual tree. Every one must know that situation and soil may make one tree more forward than another of the same species, by at least a week.

One other observation may not be thought improper in favour of this sort of record, that it may serve to ascertain the precise difference of seasons in every state in the union. For we cannot doubt, that an example so innocent, so amusing, and probably useful, will be followed.

Nor is this comparative state of the seasons in the different states of small moment. We have horticultural works and agricultural publications from the presses of almost all our states, and without a comparative acquaintance with the

different progress of vegetation in these several states, how can we follow, or know how to apply their rules? If any man should sow, plant, or manage his garden, in New-England, by the authority of M'Mahon, whose experience was founded on the climate of Pennsylvania, he would make most serious mistakes.

If he were to plant the sweet potatoe at the season in which it is planted in Carolina, it would certainly never vegetate; and he must allow a fortnight between even the Jerseys and Massachusetts. Yet he ought not thence to infer that our season is too short for the sweet potatoe, since our vegetation is rapid and vigorous in proportion to its tardy appearance. Thus to take this same plant: We have gone on for 170 years under the presumption that this was a plant not destined for us; that it was our forbidden fruit; but it is well ascertained that we can produce it in perfection.

We now proceed to our comparative view.

CHERRIES

Began to open their flowers as follows:

In 1813. May 10.

1815. May 10.

1816. May 6. The memorable cold and unfruitful season.

1817. May 6.

1818. May 17.

1819. May 6.

1820. May 2.

1821. May 9.

Average time of flowering of the cherry by the above statement, May 8.

PEARS

Began to open their flowers:

In 1813. May 20.

1816. May 12.

1817. May 7.

1818. May 24.

1819. May 17.

1821. May 13.

Average time of flowering of the pear, by these observations, May 15.

PLUMS

Began to blow :

In 1815. May 14.

1817. May 7.

1818. May 21.

1819. May 13.

1821. May 11.

Average time of flowering of the plum, by the above, May 13.

MESPILUS CANADENSIS, OR SNOWY MEDLAR,

A native plant, not under cultivation, began to open its flowers :

In 1813. May 11.

1815. May 16.

1816. May 9.

1817. May 8.

1818. May 18.

1819. May 16.

1820. May 3.

1821. May 10.

Average period of opening of the *Mespilus Canadensis*, May 11.

APPLES

Began to open their flowers :

In 1813. May 23.

1816. May 18.

1817. May 12.

1818. May 25.

1819. May 20.

1820. May 11.

1821. May 17. Though some few appeared 4 days before, on the Siberian crab.

Average time of first expanded flowers on the apple,
May 18.

From the above comparison it appears that the extremes seldom, and, indeed, we may almost say never, exceed fifteen days : that is, that the earliest period of flowering of any given plant, does not vary from its latest period of flowering in different years, more than 15 days. We are authorised to draw this conclusion, because we think that the above years probably comprize the earliest and latest seasons which have been known for 40 years. The season of 1818 was backward beyond all ordinary example, and yet was fruitful. The season of 1820 was *as remarkably early*, and yet few seasons ever exceeded it in fruitfulness. Not a single tender fruit suffered from the very early flowering. The cold and calamitous summer of 1816 was quite an early one, and very promising at first. We ought not, therefore, to be alarmed or anxious either at an early, or late spring. It will be seen, that each of the above-mentioned trees approach as to the time of its flowering to the mean time, in much the greater number of years. In general, they blow 2 or 3 days either before, or after, the mean time. It may not be thought uninteresting to add to the above account of the time of flowering of sundry trees, the first appearance of ripe fruits, and productions. It will be recollected that we have not given an account of this sort in our Journal for several years past.

Strawberries first ripe—

In 1813. June 20.

1815. June 21. Strawberries in considerable quantities.

1818. June 25. This was the latest year known for
many years.

1819. June 21.

1820. June 20.

It must be interesting to perceive, that whatever the variations may be in the flowering of plants, the time of ripening is so nearly equal. Instead of the extremes varying 15 days, as in the case of flowering, we find them varying in

ripening, but five days. That the mean time of ripening of the strawberry is the 21st of June, and that in four years out of five it ripens on that day, or only one day from it. This again proves the folly and rashness of complaining of too early or too backward seasons.

Cherries first ripe—

In 1813, June 26. Gathered as unripe as if designed for the Boston market, where ripe cherries are never seen till they become a drug.

In 1815. Unripe cherries gathered June 24th.

Ripe black hearts July 3d—The black heart is not the earliest though not a late cherry.

In 1816. First cherries gathered July 4th.

Black hearts ripe July 6th.

Black hearts generally ripe July 8th.

In 1818. First early and unripe Boston market cherries gathered July 2d.

In 1820. Early May cherry fit for table June 21st.

Black hearts ripe July 4th.

All cherries in perfection July 8th.

It will be seen that the cherries of various kinds differ much from each other in the time of maturity, but to take the best, the black heart, by whatever name it may be called, as the rule, it may be affirmed that their mean time of ripening is the 4th of July. By ripeness we intend a very different thing from what our excellent and industrious neighbours who raise for the market, mean by the same expression. We understand that state of the fruit in which it has arrived at perfection, which is from five to ten days later than the Boston connoisseurs ever see it, unless they continue to purchase it after it sinks to six cents the quart, and when it is rather a jelly before it gets to market, than a fruit.

May we not here introduce a practical remark for the benefit of our Boston friends and customers. Can they not insist by proper rewards, which is the only mode, that their strawberries shall be carried to them in pottles, that is in in-

verted cones of basket work ; and that the cherry should be carried to market in some better mode than potatoes, which are always transported in bulk ?

We respectfully suggest these ideas, because we know that the Boston epicures pay more liberally and are worse served, than any people in Europe, Asia or America.

Things have been mending, it is true, in this respect, but never was a generous, luxurious people furnished with less regard to their comfort and taste than the inhabitants of the "head quarters of good principles."

We ought in justice to our thriving and intelligent neighbours to state, that they have made, and are constantly making great efforts, from year to year, to supply the market with earlier vegetables, and in better condition. They have learned to raise the cabbage, and the lettuce the fall before, and to preserve them in hot bed frames—but ought not the opulent town of Boston to have the cauliflower always in perfection ? and the sea kale ? and the salsafy ? and the Brussell's sprouts ? We think they are entitled to it ; and to a better mode of conveying the nicer productions. This a generous price, and a discrimination between those who take pains to please, and those who do not, will alone effect.

Raspberries and gooseberrries (which usually ripen together) began to ripen

In 1813. July 12th.

In 1815. July 15th.

In 1820. July 10th.

It ought to be noticed that these remarks were made on a single estate. Other persons with more favourable situations may have raised these fruits at earlier periods ; but we must protest against a comparison with the periods at which they first appear in the market, it being notorious that unripe fruits are always sent to the Boston market in the early part of the season.

Still our comparison may well serve as a guide to show the relative state of each season, and of the various fruits of our country.

Roxbury June, 5, 1821.

REPORT OF A COMMITTEE TO WHOM WAS REFERRED
THE APPLICATION OF MR. E. HERSEY.

THE committee appointed by the trustees of the Massachusetts Agricultural Society, to inquire into the facts relative to the destruction of the worm commonly called the borer, which has of late years been so injurious to the apple trees, in this neighbourhood, and to ascertain whether any thing be due to the exertions and adroitness of Mr. Ebenezer Hersey, of Roxbury, housewright, and generally known as a successful *Grafter*, in destroying this troublesome and voracious insect, beg leave to report:—That they find, although it be uncertain whether Mr. Hersey was the first person who discovered the easy mode now practised by him in taking the insect from the body of the tree, yet they are satisfied that the great advantage which the public are like to derive from the extirpation of this worm, is principally owing to the exertions and cleverness of Mr. Hersey, in this branch of his profession, and they recommend that a premium be awarded him of twenty-five dollars.

Your committee feel it incumbent on them to state for your information, that Mr. Hersey has extirpated the insect in at least a thousand apple trees on *one* farm in Roxbury; that he has probably saved many thousand in other parts of that town and its neighbourhood, either by his personal attendance and labour, or by the information which he has given to others on the subject; that he has restored to vigour and soundness, many valuable peach trees that were gummy and rapidly declining from the effects produced by this or a similar worm; that he has traced them to the mountain ash, and saved many of those beautiful trees from perishing: and your committee have no doubt, if, from this example, the farmers of this commonwealth will examine their orchards, and cut out these insects from their trees wherever found, they will in

a short time feel the benefit of their attention in the increase and improved quality of their fruit.

Your committee feel it their duty also to add, that from their own experience, they feel assured, that all those who can command the services of Mr. Hersey, will find it more economical to employ him to perform this work than to undertake it themselves; as his experience and original profession of housewright, acquainted with the use of tools, enables him to do it not only more thoroughly, but very much quicker than any one can who has not been in the practice of the art.

The seasons when this operation is performed with most effect are the spring and fall; and if in the spring, before the month of June, as the perfect insects escape before that time. In apple and mountain-ash trees, the existence of the animal in the tree may be generally known by the mossy appearance on the bark; and it may be traced by removing a little earth from the body of the tree next above the insertion of the great roots. Although the hole at which the insect enters is in many instances very small, yet it is easily discovered by an appearance of powdered wood or fine saw dust which is thrown out by the worm; here you may introduce your chisel and follow his track. Cut the bark smooth, and when you have cleansed the trees of all the insects (of which there are sometimes as many as twenty to be found,) plaster the wounds over with a little clay, and when it is dry restore the earth to its place. The operation should be renewed the succeeding season to make the work complete. In peach trees the insect is traced by the gum, but as this is also produced by bruises, it is not infallible.

SAM'L. G. PERKINS, }
JOHN PRINCE, } *Committee.*

Note.—If the frost be out of the ground, we recommend to farmers to perform the spring cleansing as early as March and April.

Boston, April 16.

Vol. VI.

AGRICULTURAL INTELLIGENCE.

Mr. Young and the Halifax Agricultural Societies.

WE have forborne to notice the extraordinary revolution in agricultural efforts in Nova Scotia, (which has been produced, as it would seem, principally by the intelligence, learning and indefatigable exertions of a Scotch gentleman, who has within a few years removed from Scotland to Halifax, John Young, Esq.) not most assuredly from any spirit of rivalry or envy, and still less from any national feelings, but simply because we have been in constant expectation of seeing Mr. Young's admirable essays embodied and circulated throughout this continent. This gentleman published a series of numbers on agricultural subjects, in one of the newspapers at Halifax, which we do not think we hazard much in asserting, contained more profound thoughts on the subject of agriculture, and embodied a greater extent and variety of science applicable to this art, than has yet appeared from the pen of any individual in this country.

Though the essays were anonymous, they soon attracted universal attention in that province, and excited a spirit of inquiry, and an ardour for improvement, which we may truly say is without a parallel. So perfectly was the secret of the author kept, that the essays were attributed to his Excellency the Earl of Dalhousie, and they might well have added to the splendour of any titled man.

The excitement produced by them was so great, that this province, comparatively poor when put in contrast with some of the powerful, and opulent, and more fertile states of our confederacy, voted large sums to endow provincial and county agricultural societies ;—sums which might well put to the blush the more parsimonious efforts of our own republic.

A secretary of the board of agriculture in Nova Scotia was provisionally appointed, with an understanding, that whenever

the justly celebrated author of these essays should be known, that office should be vacated in his favour.

Mr. Young was persuaded by his friends to quit his retirement, and was with universal approbation promoted to the office of secretary and treasurer, and as far as we can judge, efficient manager of the institution.

It is difficult for persons at a distance to ascertain the precise value of these efforts, but so far as we can judge from the reports of the board of agriculture of that province, we should be disposed to believe that it had been fully equal to the extraordinary diligence, vigour, intelligence and learning which first excited and directed them. New systems have been introduced with great success;—new directions have been given to industry. Some facts most extraordinary with regard to the changes produced in the culture of that province have been published by the provincial society, of which no doubt can be entertained;—and it would seem, that this cold, and as we have thought, inhospitable soil, is very likely to be a rival to ours, in the most valuable agricultural productions. We do not enter further into particulars, because we still hope to afford by a review of Mr. Young's essays, and successful exertions, complete evidence of the wisdom and energy of his plans.

We feel sure, that on a subject so interesting to the whole human family, no prejudices will operate to prevent the free circulation of his opinions, and that a disposition will be felt to render full justice to his merits. In New England especially, we have abundant reason from the similarity of climate to listen with impartiality to so wise a counsellor as Mr. Young, educated in Scotland, whose climate and productions are so analogous to our own.

New-York Agricultural Publication.

We have seen a recent publication from the board of agriculture of the state of New-York. It would be, perhaps, little praise to a state so full of intelligent and enlightened

men to say, that the work is entitled to respectful attention. There are two essays of considerable length which occupy the greater part of the volume.

One of them is avowedly written by Mr. Featherstonehaugh, of Duanesborough, and the other would seem to be the work of the same author. They are, both of them, highly respectable, and ought to excite a spirit in Massachusetts to sustain the character of the state by publications of equal merit.

We did not feel ourselves at liberty to make any extracts from the work, because we understand, that a review of it is expected in a publication, which has a wider circulation, and which is entitled to more, and higher consideration, than the very humble and unpretending Journal, which we address to the farmers of Massachusetts.

New-Hampshire State Agricultural Society.

We have understood that this state has made provision for, and incorporated a general state society, the members of which are to be composed of delegates from the county and local societies. With us we have no such establishment. The Massachusetts Agricultural Society has nothing which gives it either authority or pre-eminence over any county society. Nor do we wish that any such power should be delegated. We cannot conceive any advantage which could be derived from any general society.

If local, with general powers, it would be the object of jealousy. If composed of gentlemen from all parts of the state, its meetings would be few, formal, expensive, and productive of no substantial good. All that agricultural societies ought to wish, is a charter to enable them to manage their funds, and occasional aid from the legislature to enable them to give that spring to agricultural experiments which is the soul of all exertion. A little money, and some distinction, are admirable helps to individual efforts. A man who makes great exertion to reclaim a stubborn piece of land, to produce a great crop, to raise a fine animal, wants

something besides the consciousness of the value and importance of his efforts, to reward him. And the public want this notoriety more than he does.

Successful efforts are often lost to the public, owing to the diffidence of the individual and the difficulty of making them known. Can there be a wiser or more economical application of the public money than restoring a small part drawn from the subject in the form of taxes, in the shape of premiums to encourage the increase of products, and thus, in its turn, increasing the ability to pay taxes, and enlarging the fund from which they are drawn?

We are, for the reasons above stated, against any general society with superior powers, or even titles, but in favour of an increased liberality towards the local societies which either do, or may hereafter exist.

A communication from the Hon. Timothy Pickering, on the culture of peas, has been, by some accident, mislaid, after being ordered for publication, and must, of course, be postponed till our next number. We regret it, because we always feel a sincere pleasure in perusing the plain and practical articles from the pen of this venerable and experienced cultivator, and we are convinced that they are highly useful.

That accidents such as this may not be attributed to negligence, we would observe, that the duty of editing this Journal, is not unfrequently divided; and, between various members of a committee for publication, papers may occasionally be mislaid, without any imputation of neglect.

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